

5.5 SITING OF LARGE-SCALE WIND TURBINES

With the political, economic, and ecological pressure to lessen dependence on fossil fuels for energy supply, communities throughout Atlantic Canada are looking at alternative sources of energy. Wind energy is expected to become an important source of renewable energy, as it has become an increasingly viable and abundant source of energy, particularly in Nova Scotia. Through the Municipality’s Integrated Community Sustainability Plan (ICSP) Council has made a commitment to sustainability principles, in particular, the promotion of renewable energy development.

In seeking to provide opportunities for economic development, Council recognizes the benefits that large-scale wind development can have on individual property owners as well as the Municipality as a whole. By permitting large-scale wind development within the rural areas of the County, Council intends to strengthen the economic base of Kings County while also contributing to the Provincial renewable energy target. Large-scale wind turbines, also known as utility-scale wind turbines, are those turbines with a rated output capacity greater than 100 kW per year. These wind turbines can be developed in groupings or individually and are generally connected to the local transmission or distribution grid.

Council’s aim is to provide opportunities for large-scale wind development where there is a known wind resource and where large-scale wind development is compatible with the surrounding land uses. The wind resource in Kings County is greatest in areas along the North and South Mountains. Therefore, Council will allow large-scale wind development in these rural areas of the County where the focus is on the protection and enhancement of natural resources and the encouragement of primary resource development. Council intends to encourage wind development in a way that limits safety, noise and visual impacts on neighbouring uses. This will be achieved by requiring minimum setbacks and separation distances between large-scale wind turbines and neighbouring dwellings.

5.5.1 Large-Scale Wind Turbine Objectives

- 5.5.1.1 To promote the development of large-scale wind turbines in an effort to reduce the Municipality’s dependence on non-renewable energy.
- 5.5.1.2 To respond to the Provincial call for increased sources of renewable energy.
- 5.5.1.3 To minimize the potential negative impacts of large-scale wind turbines on neighbouring land uses and to ensure an acceptable standard of safety and compatibility.

5.5.1.4 To maintain consistency with and support for the rural goals of the Strategy.

5.5.2 Large-Scale Wind Turbine Policy

5.5.2.1 Council shall provide for the siting of large-scale wind turbines within certain zones in the Agricultural (A), Forestry (F), Country Residential (CR), and Shoreland (S) Districts.

5.5.2.2 Notwithstanding Policy 5.5.2.1, Council shall not allow large scale wind turbine(s) within the Grand Pré and Area Plan boundary.

5.5.2.3 Council intends to regulate the placement and appearance of large-scale wind turbines to mitigate any potential negative impact they may have on surrounding uses. Therefore, the Land Use Bylaw will include the following provisions:

- a. minimum required setback from property lines, public rights-of-way and coastlines;
- b. minimum required separation distance from dwellings on neighbouring properties;
- c. other minimum requirements focused on ensuring the safety of the development;
- d. controls for signage and turbine appearance; and
- e. requirement of an emergency response plan and a decommissioning plan.

5.5.2.4 Council shall include provision in the Land Use Bylaw to regulate the use of wind monitoring (meteorological) towers. These regulations shall include limits on the location of the towers and requirements for a development permit to ensure safety and mitigate conflict with neighbouring uses.

PART 5	ENACTED DATE	SECTION
	June 2, 2011	5.5

Appendix B – Land Use Bylaw Section 10.1.6, “Siting of large-scale wind turbines”

10.1.6 Siting of Large-Scale Wind Turbines

- 10.1.6.1 One or more Large-Scale Wind Turbines shall be permitted in an A1, F1, R6 or S1 Zone, except on properties within the Grand Pré and Area Plan boundary, subject to the following:
- a. the blade clearance shall be a minimum of 25 feet;
 - b. the minimum separation distance between wind turbines shall be equal to or exceed the height of the tallest turbine;
 - c. the wind turbine(s) shall be setback a minimum of one (1) times the turbine height from rear, front and side lot lines, public rights-of-way and coastlines;
 - d. where a lot located immediately adjacent to and abutting a lot where a large-scale wind turbine is to be erected will be used for wind turbine development and the turbines on both properties are part of the same proposal, the setback requirement (contained in Section 10.1.6 c.) from the shared property line shall be reduced to zero;
 - e. the wind turbine(s) shall be located a minimum of 2300 feet (700 m) from any dwelling on a neighbouring property. This separation distance does not apply to a dwelling on the same property on which the large-scale wind turbine is installed or a dwelling on a neighbouring property containing a wind turbine that is part of the same proposal;
 - f. notwithstanding 10.1.6.1 e. above, where a dwelling is constructed within the required separation distance of a large-scale wind turbine development, the wind turbine development may expand. The required separation distance for any expansion shall be equal to or greater than the separation distance between the initial wind turbine development and the dwelling;
 - g. a development permit may be issued for one or more large-scale wind turbines to be located on a lot which does not front on a public street provided proof of access can be demonstrated;

- h. the wind turbine shall be finished in a non-reflective matte and in an unobtrusive colour;
- i. the only artificial lighting permitted on the wind turbine is lighting that is required by federal or provincial regulation;
- j. no signage shall be permitted on the wind turbine except that of the manufacturer's identification;
- k. the owner(s) of the land on which the wind turbines are located shall notify the Municipality of Kings County within one (1) year of wind turbine inactivity and shall remove the wind turbines and associated infrastructure within two (2) years of wind turbine inactivity.

10.1.6.2 Upon application for a development permit for a large-scale wind turbine, the developer shall submit the following documentation:

- a. the project definition including installed turbine(s) capacity, targeted long term production levels, scale elevations or photos of wind turbines showing total height, tower height, rotor diameter and colour;
- b. a site plan showing all buildings, roads, boundaries, natural features and alterations of site;
- c. wind turbine manufacturer's specifications and professional engineer's design and approval of turbine base(s);
- d. copies of all documentation required for *Canadian Environmental Assessment Act* and *Nova Scotia Environment Act* and regulations, if applicable;
- e. evidence of notification to and approval from Department of National Defence, Nav Canada, Transport Canada or other applicable agencies regarding potential radio, telecommunications and radar interference, if applicable;
- f. an emergency response plans for site safety;
- g. a decommissioning and reclamation plan; and
- h. any other information the Development Officer deems necessary to determine whether the development conforms to this Bylaw.

Appendix C – Land Use Bylaw Section 10.1.7, “Siting of wind monitoring (meteorological) towers”

10.1.7 Siting of Wind Monitoring (Meteorological) Tower

- 10.1.7.1 One or more Wind Monitoring (Meteorological) Towers shall be permitted in M2, M3, M4, M5, M6, M7, A1, F1, S1, S2, CS, R6, R7, R8, O2 Zones subject to the following criteria:
- a. A minimum separation distance between towers shall be equal to or exceed the height of the tallest tower.
 - b. The setback shall be, at minimum, equal to the tower’s total height from rear, front and side lot lines, public parking lots and public rights-of-way.
 - c. For properties that abut an A1, F1, or O1 zone, the rear and side setback in common with the A1, F1, or O1 zone may be reduced by 50% if the wind monitoring tower is no closer than the total height of the tower from all structures on the neighbouring property.
 - d. Any climbing apparatus shall be a minimum of 10 feet above grade.
 - e. The wind monitoring tower shall not be located within a radius measuring 300 feet or 3 times the overall height of the tower from a residential dwelling on a neighbouring property, whichever is greater.
 - f. In addition to the application for a development permit, the following items are required:
 - Provide the manufacturer’s information including: type of tower and total height;
 - Provide a site plan showing the location of the wind monitoring tower(s) in relation to lot lines, dwelling on property and distance from adjacent dwellings;
 - Submit any necessary authorisation documents from Transport Canada and NavCan;
 - Submit an Environmental Impact Assessment (only for sites located all or in part in an O2 Zone); and

- Submit tower and base designs certified by an engineer licensed to practice in Nova Scotia, and applicable letters of undertaking.
- g. There shall be no signs or advertisements attached to or added to the tower(s).
- h. The owner(s) of the land on which the wind monitoring tower is located shall notify the Municipality of Kings County within one (1) year of removing the wind monitoring tower.



Municipality of the County of Kings
Report to the Planning Advisory Committee
Large-Scale Wind Turbine Policy Options
Prepared by Leanne Chisholm, Planner
April 27, 2010

1. Introduction

Kings County does not currently have any policies or regulations to guide the development of large-scale wind turbines. Therefore, large-scale turbines with an output capacity greater than 100 kilowatts are not permitted. The Municipal Planning Strategy and Land Use Bylaw do permit small-scale wind turbines up to 170 feet in height. However, there has been interest from wind proponents to develop large-scale wind turbines in the County. Large-scale wind turbines, also called utility-scale wind turbines, are generally capable of generating 1-2 mega watts (MW) of energy each. They may be built on their own or in combination with other turbines in a wind farm. Large-scale wind turbines are designed to tie into the power grid of Nova Scotia Power Inc. (NSPI) to help reduce the Province’s consumption of fossil fuels.

Although federal and provincial regulations often apply to the development of wind turbines, municipalities in Nova Scotia have the ability to control the location of wind turbines through their municipal planning documents. The siting of large-scale wind turbines has been controversial in Nova Scotia over the past few years and has met with public resistance in some Municipal units. Council has directed staff to review the pertinent issues of wind turbine siting within the County and to recommend policy options for their regulation. This report outlines impacts associated with large-scale wind development, related policies within the Municipal Planning Strategy, potential tools for regulation, and options for policy development.

2. Background

With the political, economic, and ecological pressure to lessen dependence on fossil fuels for energy supply, communities throughout Atlantic Canada are looking at alternative



sources of energy. In July of 2009, the Government of Nova Scotia announced that by 2015, 25% of the province’s electricity will come from renewable sources, including wind, tidal and solar power. Wind energy is expected to become the most important of

these, as it has become an increasingly viable and abundant source of energy, particularly in Nova Scotia.

2.1 The Integrated Community Sustainability Plan (ICSP)

Through the Municipality's Integrated Community Sustainability Plan (ICSP) Council has made a commitment to sustainability principles. The community vision expressed in the ICSP calls for a community whose "*energy sources are renewable*". Public consultation that took place throughout the development of the ICPS indicates that facilitation and promotion of renewable energy development was considered a high priority item under both the environmental and economic pillars of sustainability. The development of wind turbines contributes both to environmental sustainability by reducing our dependence on non-renewable energy, and to economic sustainability by providing income for land owners who lease land for wind development and by increasing the Municipal tax base.

The ICSP's Environmental Action Plan goal is for Kings County to progress as a society with a smaller impact on the natural environment. The Energy Action Plan aims to reduce the County's dependence on non-renewable energy. One of the action items within the Energy Action Plan is to complete development of land use policies for wind energy and to be proactive in setting criteria for wind development site selection.

2.2 Wind Turbine Impacts

There are various real and perceived impacts associated with large-scale wind energy development. A report entitled "Model Wind Turbine By-laws and Best Practices for Nova Scotia Municipalities" released in January, 2008, provides valuable information on wind turbine regulation. This report was developed as a joint initiative between the Union of Nova Scotia Municipalities and the Province of Nova Scotia. It aims to provide municipalities with guidelines taken from across Canada, USA, and Europe to create wind turbine zoning and bylaws that fit their local community. The Model Wind Turbine By-Law outlines the following impacts associated with Wind Turbines.

2.2.1 Noise

The impact of noise from wind turbines is a subject of much debate. There is a lack of commonly accepted standards and varying perspectives regarding concerns around sound emission, amplitude modulation, and infrasound. Sound produced by large-scale wind turbines is generally caused by the mechanical movement of parts and the sound of blades moving through the wind. Amplitude modulation is the name given to the distinguishable pulsing or "swooshing" sound that occurs as a blade passes the turbine tower. Infrasound has a frequency too low to be detected by the human ear, but is experienced through vibrations. Recent studies show that infrasound generated by wind turbines should not be considered a concern to the health of nearby residents as newer models of wind turbines have been able to greatly reduce levels of infrasound emitted.

The impact of noise depends on many different factors such as setting, type of wind turbine, vegetation, topography, height of turbines, etc. Site-specific studies and forecasts can be performed by qualified experts to determine suitable distances. However, there is no accepted standard for calculating noise propagation. A decibel approach to separation distance would require the developer to demonstrate that proposed turbines will be sited to ensure noise levels will not exceed a set limit at

adjacent property lines. This could be demonstrated by submitting an assessment performed by a qualified acoustics professional, or a noise propagation report produced by professional wind farm design software. These assessments should consider the variability of ambient background noise, nearby structures, wind conditions and terrain. A commonly accepted noise limit at an adjacent property line is 45 decibels or 5 decibels above background noise levels. This approach is predictive in nature and may require noise monitoring to ensure anticipated noise standards are met.

Separation distances from residential buildings and property lines are the most widely used method for mitigating noise. Noise effects on nearby lands are reduced by placing the turbine far enough away to achieve desired noise levels. The Model Wind Turbine Bylaw states that despite many uncertainties regarding noise impacts, the majority of jurisdictions across North America and Europe that have established separation distances have decided that distances 1000m (3280 feet) or less, with most at 700m (2300 feet) or less, or 3 to 4 times overall turbine height, are satisfactory. The advantage of this approach is simplicity. However the first method, the decibel approach, gives consideration to unique site characteristics, allows for changes in technology, and makes the most efficient use of space. The Model Bylaw suggests that a prudent approach is to combine the two methods by prescribing a minimum separation distance unless proponents can satisfactorily demonstrate (through defensible modeling) that acceptable decibel limits are not exceeded.

2.2.2 Aesthetics

The aesthetics of wind turbines are very subjective and difficult to control. Completely eliminating the visual impact of wind turbines is not possible. Large-scale wind turbines are large, dispersed and easily visible structures. Typically, they are constructed on ridgelines, or other high topographical features to exploit the excellent wind conditions in these areas. This often makes them visible from



most of the surrounding lowlands. The Model Bylaw suggests that large uninterrupted visual landscape have a greater ability to accommodate and neutralize visual impacts of turbines. Municipalities can require visual impact assessments to help assess the visual impact of a large-scale wind turbine development.

2.2.3 Safety

When wind turbines are not manufactured or maintained properly they can pose safety risks to their surrounding environment. Some risks are inherent in wind turbine operation, but can be mitigated with sufficient setbacks.

Shadow flicker

Shadow flicker occurs when the sun's rays are disrupted by the spinning of wind turbine blades. The disruption of light waves can, in rare cases, cause reactions in the human brain and seizures. However, when this effect is caused by a three-bladed wind turbine it only creates a minor nuisance. According to recent studies, the frequency of the flickering effect caused by a wind turbine is not sufficient to cause an adverse response in the brain.

Structural failure

Structural failure in wind turbines is extremely rare. Modern wind turbines are designed to be structurally sound during all types of wind conditions. Large-scale wind turbines must be fitted with a braking device that stops turbine rotation if wind speeds become too fast for the turbine to safely operate. This feature prevents structural failure.

Ice throw

Certain weather conditions can cause ice to accumulate on wind turbines blades. The ice either falls from a stationary wind turbine or is thrown from a rotating blade. Ice throw only has impacts on the surrounding few hundred meters of the turbine. Most commercially built wind turbines have ice sensors that stop blade rotation when ice builds up. The rarity of ice throw incidents and the use of larger separation distances to mitigate other impacts make the risk of ice throw manageable.

Setbacks required for noise mitigation are normally more than the height of the turbine and therefore are normally sufficient to provide safety to nearby structures. To address issues of wind turbine safety, a general rule based on a simple formula has been developed to determine the potential "danger zone" relating to structural failure, shadow flicker and ice throw. By multiplying the overall height of a turbine (tower height plus rotor diameter) by 1.5 it is possible to establish a distance in which threats to safety are greatly minimized.

2.2.4 Environment

Impacts of wind turbines on birds and bats vary depending on location. There are generally two types of impacts that have been observed: 1) direct mortality from collisions, and 2) indirect impacts due to avoidance, habitat disruption, and displacement. Studies have shown that although bird impact is an important factor to consider when developing wind farms, they are no more detrimental to birds than other man-made structures. Specific local studies in the context of the prospective development can avoid or mitigate adverse effects on bird and bat populations. Environmental management plans are an important component to any wind farm development to address issues of erosion, wildlife impacts, habitat loss and eventual site restoration.

2.2.5 Telecommunications and Air Traffic Safety

Telecommunications and air traffic safety fall under federal jurisdiction. Wind power proponents are generally required to obtain the necessary permits from the appropriate

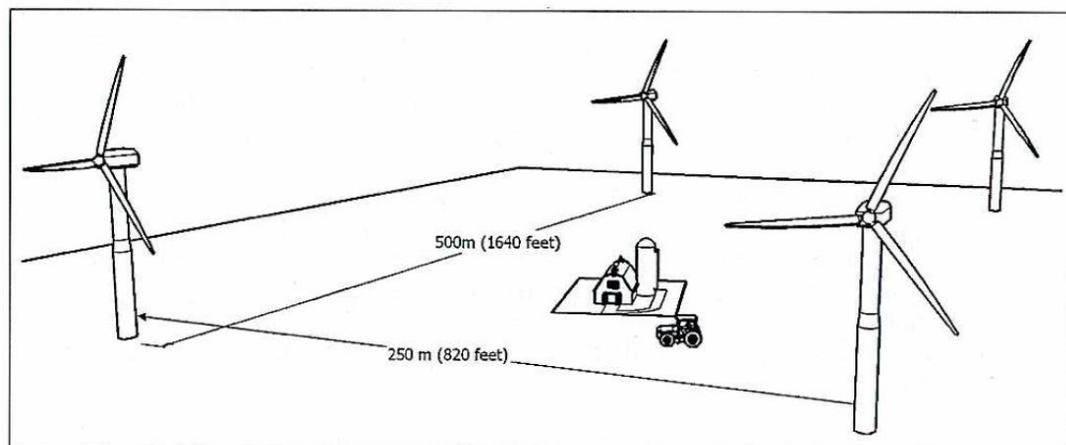
federal authorities including Industry Canada, Transport Canada, Nav Canada, and Department of National Defense.

2.3 Location

The Nova Scotia Wind Atlas illustrates wind speeds in locations across the province. It was produced with funding from the Nova Scotia Department of Energy to promote wind energy development in the Province. The atlas identifies Kings County as having tremendous potential for wind energy production. The highest wind speeds in Kings County are in rural areas along the North and South Mountain (see Appendix A). Permitting the siting of large-scale wind turbines in areas with high wind allows for the maximization of wind power production.

Mitigating the impacts of large-scale wind turbines is generally more difficult in urban areas given the higher density of development. Large-scale wind development is most easily accommodated in rural areas where the potential for conflict with neighbouring uses can be mitigated. Within the rural districts, there tends to be low residential density and more available land.

Research shows that agricultural operations can benefit greatly from wind power development. Large-scale wind power, when developed in concert with agricultural uses, can play a role in the protection of agricultural lands. Wind developments can provide farmers with an alternative income from revenue acquired through lease agreements. This income can help keep farmers in the business of farming. The Model Wind Turbine Bylaw indicates that wind farms and farming have a well-established and harmonious relationship in the US and in Europe. The small footprint of turbines and the spacing between them allows large-scale wind turbines to consume only 5-10% of the land occupied by the facility. Therefore, land taken out of agricultural production is minimal.



Typical Wind Farm Spacing

3.0 Policy Analysis

While there are no policies for large-scale wind turbines, the Municipal Planning Strategy contains policies that relate to resource development in the County.

3.1 Urban Policies

The Municipal Planning Strategy identifies as a general urban goal: to direct urban growth and development to designated Growth Centres. To reduce safety risks and avoid issues of nuisance, large-scale wind turbines should be sited a minimum distance from structures. Within the Growth Centres, the densities of residential and commercial development make it unlikely that sufficient setbacks and noise buffers can be applied. Large-scale wind development is not conducive to urban settings and may inhibit population growth within Growth Centres.

3.2 Rural Policies

The MPS states Council's goal to "*protect and enhance the high capability natural resource base in rural areas for primary resource development and associated rural land use activities*". Wind turbines harness energy from the wind, a natural renewable resource. As a form of resource development, wind turbines are well suited for rural areas.

Within the Resource and Rural Development Districts, Council places an emphasis on protecting and enhancing the County's natural resources. An objective stated in section 3.1 of the MPS is "*to provide for residential, commercial, industrial and community facility development opportunities which are related to, and supportive of, the primary resource industries*". Wind turbine development is a primary resource industry and, therefore, should be an encouraged use in the Resource and Rural Development Districts.

The MPS states that Council's goal within the Agricultural Districts is to protect and enhance the agricultural resource base. As stated above, the development of large-scale wind turbines is compatible with agricultural uses and can contribute to the viability of farm operations in the County.

Within the Forestry Districts Council places a dominant emphasis on resource production and associated industrial development. Section 3.3 in the MPS states that resource development is the priority within the Forestry Districts and residential development is considered a secondary provision. The large amounts of unoccupied land within these districts would enable large-scale wind development with sufficient distance from adjacent land to mitigate negative impacts. As a form of resource development, large-scale wind turbine development is compatible with the policies of the Forestry Districts.

The intent of the Country Residential Districts is to allow for both rural residential development and to accommodate non-residential resource development. Section 3.4 of the MPS states that "*although residential development is permitted in the Country Residential Districts, there are few restrictions placed on the resource related uses that may surround them*". Many Country Residential Districts have exceptional wind speeds, large areas of unoccupied space, and are close to roads and the power grid. These unique characteristics, and the mix of resource uses permitted in the Country Residential Districts, make them compatible with large-scale wind development.

The Shoreland Districts are located around in land lakes and along coastal areas. The primary intent of these districts, as indicated in Section 3.5.2, is for seasonal residential

development, with commercial and permanent residential development uses permitted. Large-scale wind development is not consistent with the recreational and natural environment focus of the Shoreland Districts.

The Hamlet policies place greater restrictions on resource development than the Country Residential Districts. Hamlets are intended to provide opportunities for rural residential development and commercial uses servicing the surrounding resource industries. The density of existing dwellings and the small parcel sizes within Hamlets makes it difficult to site turbines without causing land use compatibility issues. Therefore, large-scale wind turbines are not suitable within the Hamlet Districts.

Policies in Part 4.4.8 of the MPS recognize the importance of preserving scenic travel ways within Kings County. Specifically, Policy 4.4.8.2 states “*Council shall have regard to the aesthetic qualities of land use activities along the rural sections of these trails.*” Policy 4.4.8.3 establishes ‘Tourist Destination Areas’ (TDAs) which offer remarkable scenery, unique features or are close to significant heritage sites or settings. Given the visual impact that large-scale wind turbines can have on view plains, special consideration should be given when siting turbines near TDAs.

4.0 Regulatory Tools

4.1 Provincial Regulation

A provincial environmental assessment (EA) is required pursuant to the *Environmental Assessment Regulations* and Part IV of the *Environment Act* for any electrical generating facility which has a production rating of 2 Megawatts (MW) or more. The environmental assessment process involves the registration of an Environmental Impact Statement (EIS) with Nova Scotia Environment (NSE). An EA is not always required for large-scale wind developments because they do not always exceed the 2 MW threshold, at least in the initial phases. Environmental assessments are conducted to identify any impacts on human health and enjoyment of property, the natural landscape, plants and wildlife, soil and water, and other activities such as aviation and telecommunications. If negative impacts are identified, the design is adjusted to avoid or mitigate them.

4.2 Municipal Regulation

The *Municipal Government Act* establishes both the mechanisms and procedures by which municipalities can regulate development within their jurisdictions. Regulatory tools available to municipalities range from stringent regulation to more streamline permitting processes. The following is a summary of municipal regulatory tools:

- As of-right development- Minimum setback and separation distances are established in the Land Use Bylaw which is administered by the Development Officer. Council and the public are not involved in applications for wind development once the standards have been set.
- Site plan approval- Administered by the Development Officer according to siting criteria set out in the Land Use Bylaw; Council hears any appeals.
- Rezoning- Requires an amendment to the Land Use Bylaw to a zone which permits wind turbines. Council makes a decision based on submitted

information/studies, staff report and public input at a public hearing. Land Use Bylaw amendments are appealable to the Utility and Review Board.

- **Development agreement-** A contract between the Municipality and a land owner to permit large-scale wind turbine(s) under certain conditions. Special reports site-specific studies may be required. The public provide input at a public hearing. Development agreements are appealable to the Utility and Review Board.

Wind turbine development is a relatively recent use of land in Nova Scotia. Not all municipalities in the province regulate wind development. The chart below provides an overview of some of the municipalities in the province that have land use controls in place for the siting of large-scale wind turbines.

Municipality	Approach
County of Annapolis	As-of-right in Wind Resource Zone, no SB* or SD** requirements, Policies to be reviewed within one year
County of Antigonish	Rezoning to Wind Resource Zone; SB = 1x height of rotor, plus 10m (33 ft); SD = 600m (1960 ft) if less than 2 MW capacity, 1000m (3280 ft) if greater
Cape Breton Regional Municipality	As-of-right ; SD = 575 ft for turbines up to 250 ft in height, 1 ft increase in setback for each 1 ft increase in height
County of Colchester	As-of-right ; SB = 1x height of turbine; SD = 700m (2300 ft)
District of Digby	Development agreement ; noise and visual impact studies required
Halifax Regional Municipality	Currently under review
East Hants	Site plan approval ; SB = 4x overall height of turbine, unless impact study demonstrates that a lesser or greater setback is required; and noise at property line is not to exceed 40 dB or above the existing background noise
West Hants	Development agreement ; must be located outside Growth Centres, Hamlets and Villages; no set SB or SD
County of Pictou	As-of-right ; SB = 1x height of turbine; SD = 600m (1970 ft)
*SB- <i>minimum setback from property line</i>	
**SD- <i>minimum separation distance to dwelling on neighbouring property</i>	

5.0 Conclusions

The development of wind energy is consistent with provincial, national and global commitments regarding environmental protection, particularly global climate change. Wind energy has been generally accepted as one of the most promising renewable energy technologies. If properly sited, large-scale wind turbines can fulfill the Municipal Planning Strategy goals of facilitating economic development and providing for the development of the primary resources. The creation of policies that regulate large-scale wind turbines is also consistent with the goals of environmental and economic sustainability within the Integrated Community Sustainability Plan (ICSP).

There is no agreed upon approach to regulating large-scale wind turbines in Nova Scotia. Each municipality has developed their own method of regulation that fits them.

The Model Bylaw points out that any policies permitting large-scale wind development must balance the benefits of wind development with the protection of a range of other community interests. The identification of these interests, and the way in which they are protected, should be open to public input. Effective public consultation during the policy development stage is necessary to establish effective and locally appropriate wind turbine regulations.

6.0 Options

In light of the information discussed throughout this report, Staff believe the following three options should be considered when considering large-scale wind turbine development in Kings County.

Option A- Allow large-scale wind turbines through a streamline process guided by set standards. This may be achieved by as-of-right permitting or through site plan approval.

Strengths:

- Provides certainty to developers.
- Approvals can be obtained within a relatively short period of time.

Challenges:

- This is a generic approach that can exclude areas from wind turbine development which on a case-by-case basis may be suitable for wind development.
- Through this approach, it is difficult to articulate quantitative regulations that will adequately cover all impacts of wind developments.
- There is no opportunity for public input on wind development proposals once the regulations are put in place.
- There is no ability to require impact studies, or site-specific management plans.

Option B- Allow large-scale wind turbines through a site-specific approval process such as a rezoning.

Strengths:

- Allows for a public process through a public hearing, but the outcome is limited to compliance with the existing policy in the Municipal Planning Strategy.
- The onus is on the developer to meet the rezoning criteria set out in the Municipal Planning Strategy.
- Can require studies to determine compliance with criteria.
- Allows for public involvement.
- Allows the Municipality to establish locational criteria for large-scale wind turbines without having to predetermine the locations on the ground.

Challenges:

- The process can take 4-6 months
- The process is site-specific, and thus, requires an increased amount of resources
- Open to appeal to the Utility and Review Board which can add time and uncertainty to the process.

Option C- Allow large-scale wind turbines through a streamline process in areas determined to be most suitable for large-scale wind turbines, and through a site-specific approval process in others areas of the County.

Strengths:

- Distinguishes between areas of with high potential for impacts and those with low potential for impacts.
- Can take into account a variety of suitability criteria through opportunity and constraints mapping.

Challenges:

- Criteria for suitability would have to be determined and mapping analysis completed before turbine development is permitted.
- Requires a greater amount of staff time and resources.
- The level of impact may not be significantly different throughout County to warrant this more complex approach.

Option D- Maintain status quo.

Strengths:

- Allows more time for further study of wind development.

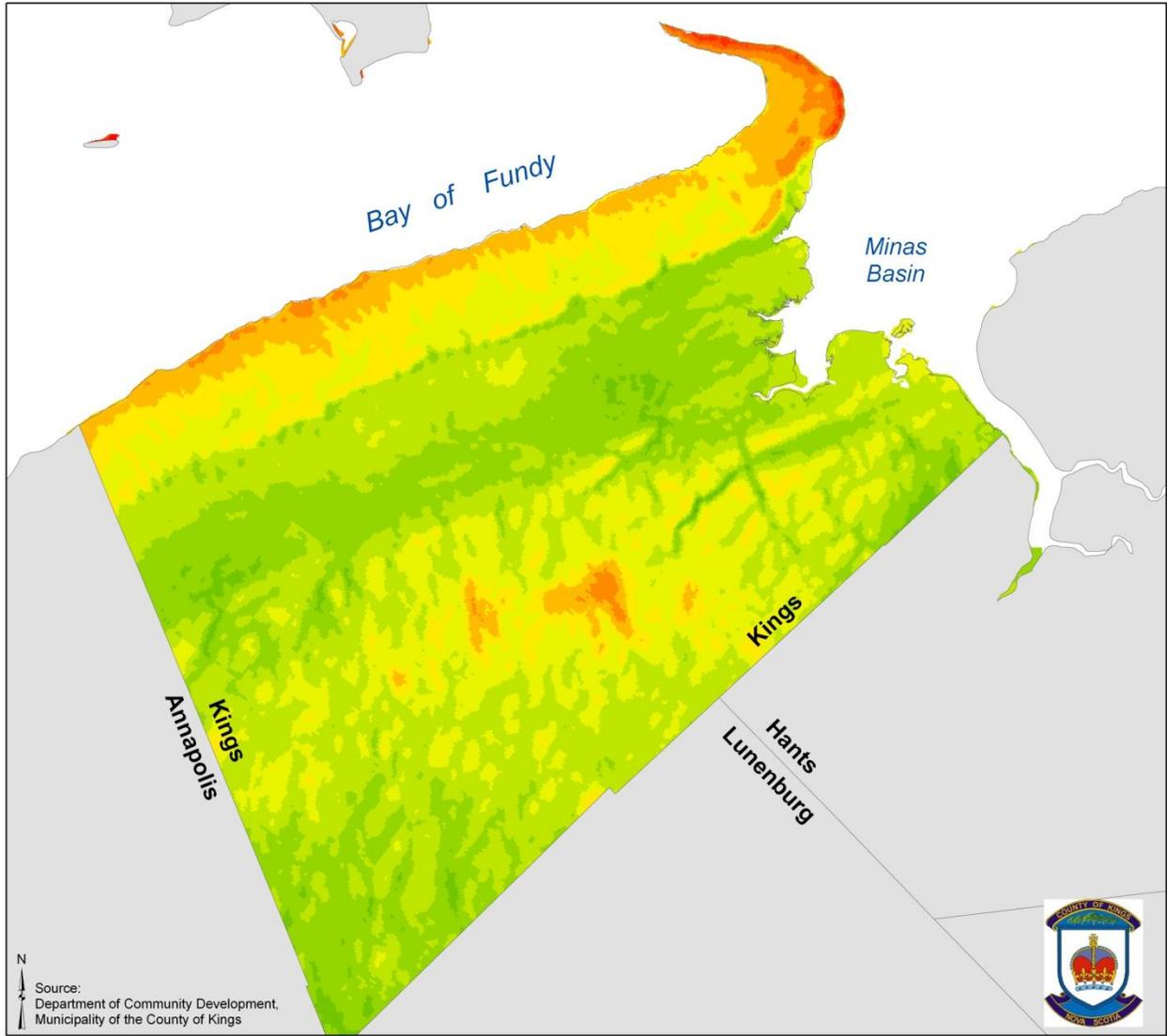
Challenges:

- This option will maintain the current restriction of large-scale wind development in the County.
- This option is inconsistent with the Province's goals to increase renewable energy sources in Nova Scotia.
- This option is inconsistent with the Municipality's Integrated Community Sustainability Plan (ICSP) which directs Council to be proactive in setting siting criteria for wind development in the County.

7.0 Recommendation

Staff recommend **Option B:** *Allow large-scale wind turbines through a site-specific approval process such as a rezoning.* Staff feel that the public should be consulted before more detailed policy options are presented. Staff further recommend that the Planning Advisory Committee forward this option to a set of Public Participation Meetings to be held in different parts of the County.

Appendix A- Nova Scotia Wind Atlas- Kings County



MUNICIPALITY
OF THE COUNTY OF KINGS

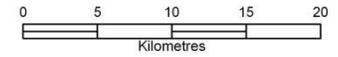
**Large Scale
Wind Turbines**

*Wind Data
80 Metres Above Ground*

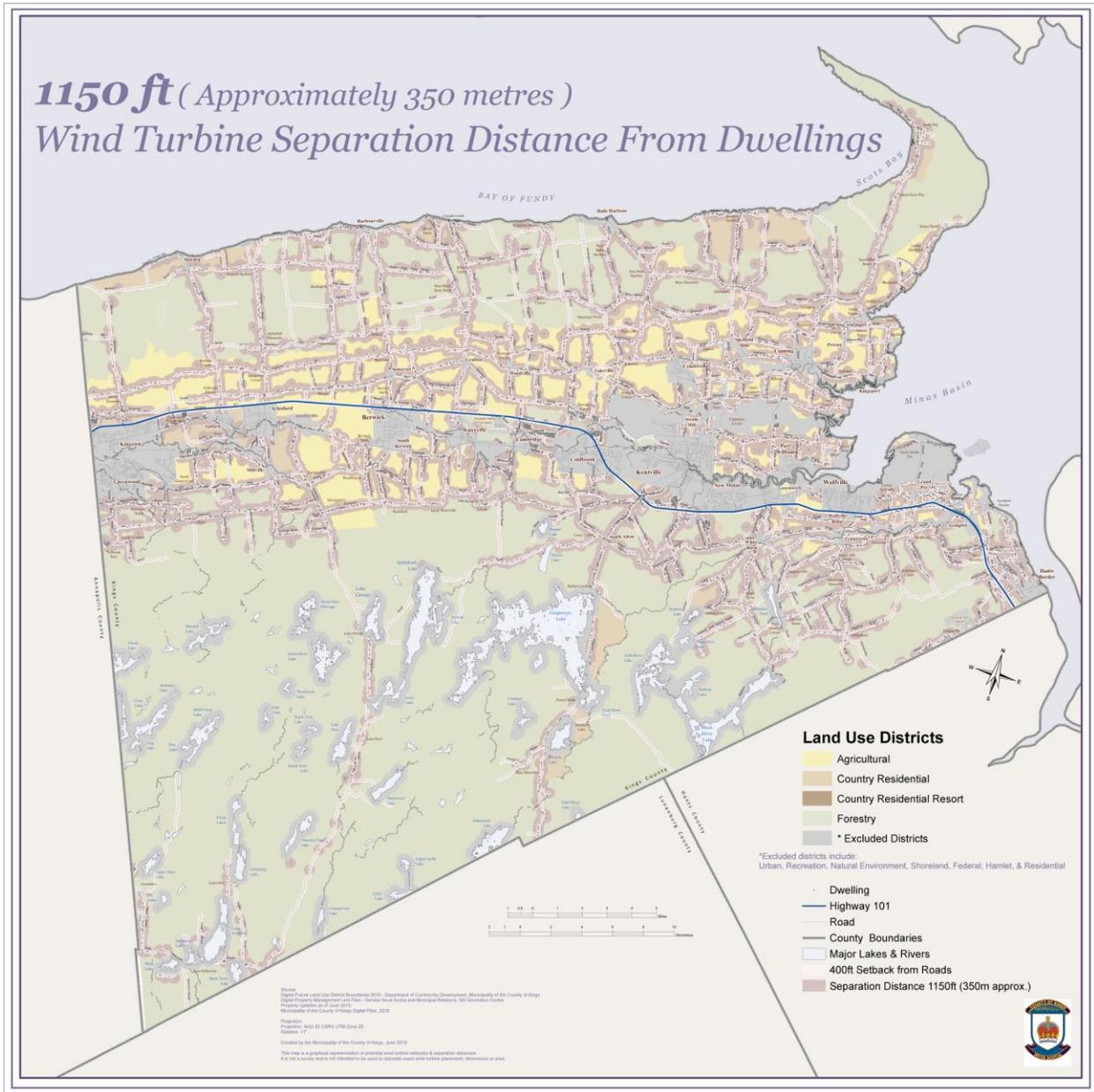
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Metres Per Second

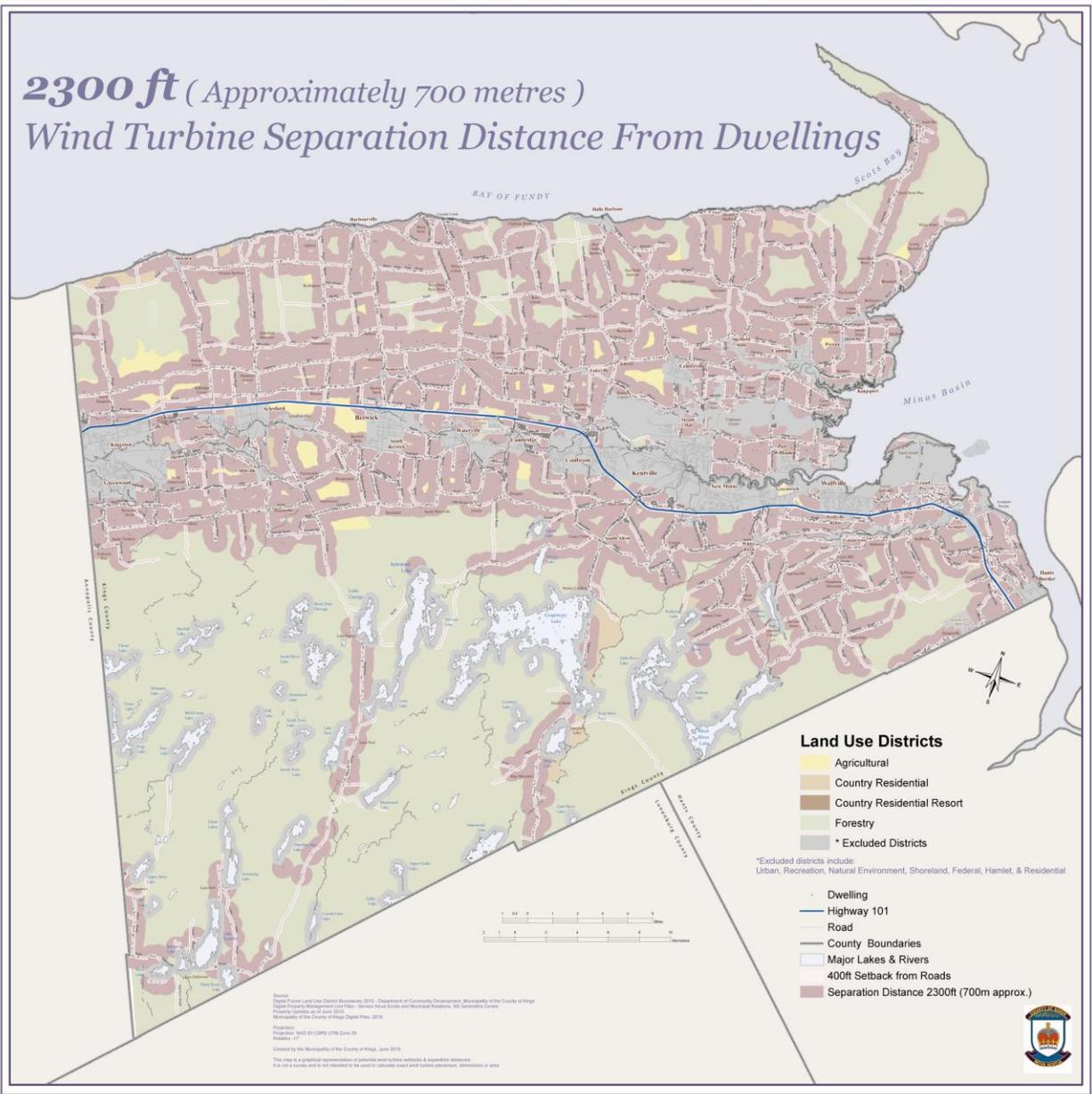
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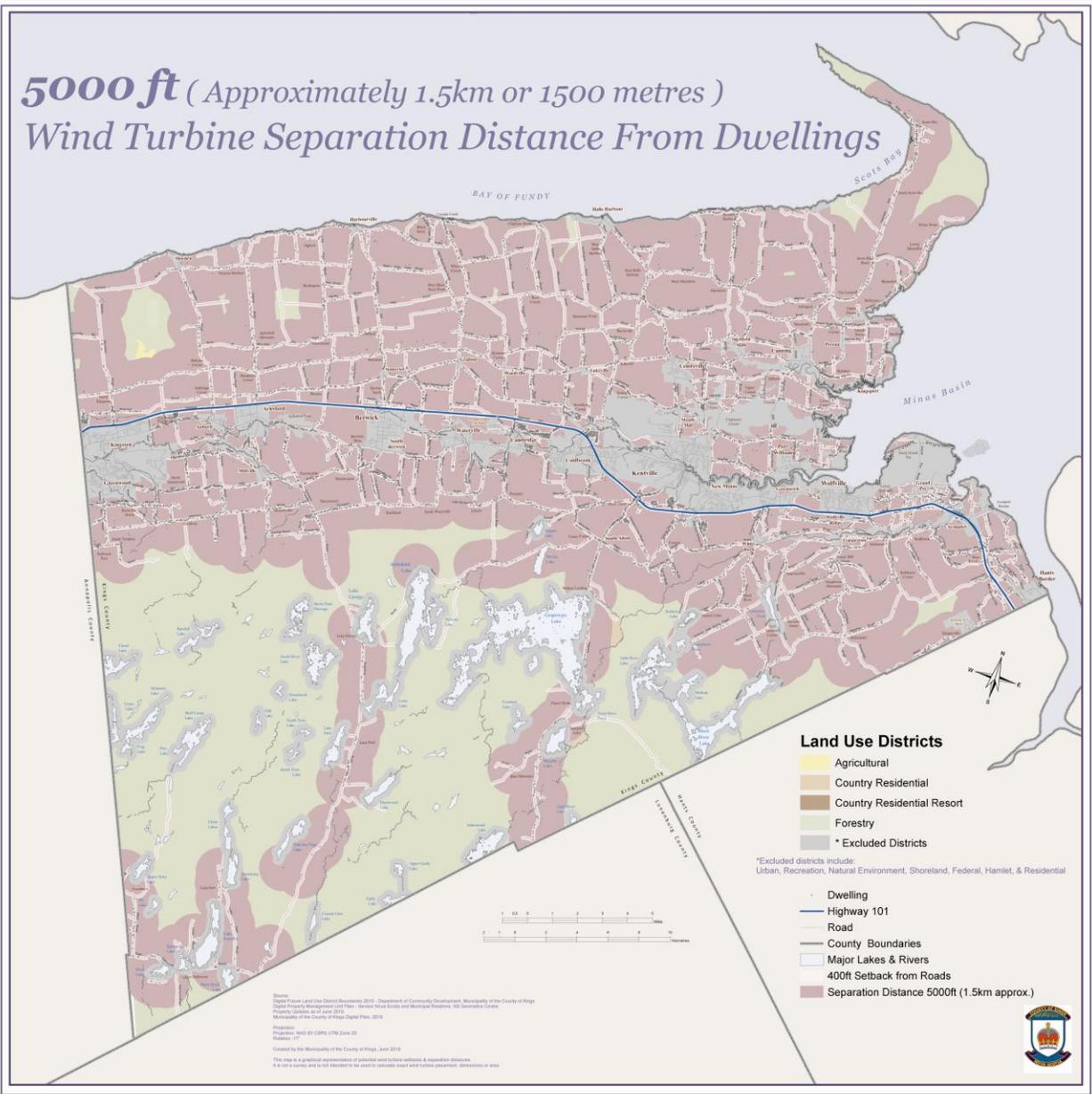
Appendix E – Maps illustrating 1150 ft (350m), 2300 ft (700m), and 5000 ft (1500m) separation distances



2300 ft (Approximately 700 metres) Wind Turbine Separation Distance From Dwellings



5000 ft (Approximately 1.5km or 1500 metres) Wind Turbine Separation Distance From Dwellings



Appendix F – Questionnaire provided to Public Participation Meeting attendees and posted on Municipal website



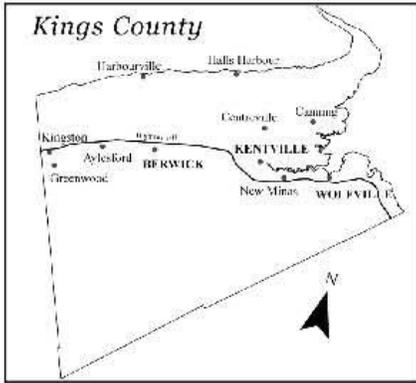
Municipality of the County of Kings

Planning Advisory Committee - Public Participation Meeting (PPM)

Wednesday, June 23, 2010
 Aylesford Fire Hall,
 1083 Park Street, Aylesford

Thursday, June 24, 2010
 Canning Fire Hall
 2232 North Avenue, Canning

Large-scale Wind Turbine Policy Options—Questionnaire



The Municipality of the County of Kings is currently developing policy to guide the development of large-scale wind power in the County. Your feedback is crucial in shaping this policy. The questions asked in this questionnaire are generally related to, and informed by, the posters on display. Please complete this questionnaire to the best of your abilities and drop it off in the provided box.

Where do you live (town or community name)?

Poster 1—Background

The Nova Scotia government has announced that by 2020, 40% of the province’s electricity will come from renewable sources. **Do you see wind power as a viable option in achieving this goal?** Yes No

Explain: _____

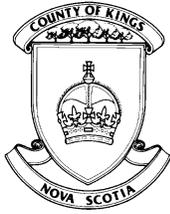
Poster 2—Impacts

Please identify which potential wind impacts are of concern to you:					
	No Concern	Mild Concern	Medium Concern	Strong Concern	Extreme Concern
Noise					
Aesthetics					
Safety					
Shadow Flicker					
Natural Environment					
Other _____					
Other _____					

Are you comfortable with a “1x turbine height” safety setback from roads and property lines?
 Yes No If “No”, what setback would you be comfortable with? _____ X

SEE OVER →

Appendix G – December 10th, 2010 Report to PAC, “Amendments to the Municipal Planning Strategy and Land Use Bylaw for the siting of large-scale wind turbines”



Municipality of the County of Kings

Report to the Planning Advisory Committee

Amendments to the Municipal Planning Strategy and Land Use Bylaw for the Siting of Large Scale Wind Turbines

December 14th, 2010

Prepared by Leanne Chisholm, Planner

1. Introduction

On April 27th, 2010 staff presented a report to Planning Advisory Committee regarding the development of new policies to regulate the siting of large-scale wind turbines in the County. This report was prepared based on the direction of Council to develop amendments relating to large-scale wind turbines. The staff report outlined background research, policy analysis and options to accommodate large-scale wind turbines in certain zones throughout the county.

The Staff report outlined the following four options in that report:

- A) *Allow large-scale wind turbines through a streamline process guided by set standards. This may be achieved by as-of-right permitting or through site plan approval;*
- B) *Allow large-scale wind turbines through a site-specific approval process such as a rezoning;*
- C) *Allow large-scale wind turbines through a streamline process in areas determined to be most suitable for large-scale wind turbines, and through a site-specific approval process in others areas of the County; and*
- D) *Maintain status quo.*

At that time Staff recommended option B: *Allow large-scale wind turbines through a site-specific approval process such as a rezoning.* PAC directed staff to hold a series of Public Participation Meetings on the issue to solicit community feedback. The details of the meetings were as follows:

Wednesday, June 23, 2010 at Aylesford Fire Hall
1083 Park Street, Aylesford

Open House 5-7 pm, Public Meeting 7 pm

Thursday, June 24, 2010 at Canning Fire Hall

2232 North Avenue, Canning

Open House 5-7 pm, Public Meeting 7 pm

PAC approved the minutes of these meetings on July 27th, 2010 (attached as Appendix 'B').

2. Input from the Public

At the Public Participation meetings a questionnaire was distributed to help solicit feedback from the public (attached as Appendix 'C'). A total of 30 questionnaires were filled out and submitted at the meetings. What follows is a summary of the feedback received by the public:

- Participants came from all areas of the valley in roughly equal proportions. However, many of the attendees mentioned that they own land on the North Mountain.
- There was near-unanimous belief in the ability of wind power to contribute to the Province's renewable energy goals.
- Overall concern about the impact of wind turbines can be described as "mild". The highest levels of concern focused on noise and the impacts to the natural environment. Shadow flicker received the lowest level of concern.
- Just over half of the participants were comfortable with a 1x setback of large-scale wind turbines from roads and property lines. Those that weren't comfortable with the 1x setback provided alternatives. The majority supported a multiplier setback, rather than a set distance. A typical suggestion was a 2x setback.
- All respondents were in favour of implementing some form of wind turbine policy. The policy option that received the single highest level of support was to allow as-of-right wind development. Site-specific regulation and a blend of as-of-right and site-specific regulation also received a high level of support. There was no decisive policy preference.
- Almost half [47%] of the participants were comfortable with the shortest separation distance to a dwelling on a neighbouring property (1150 ft or approximately 350 m). The remainder of the participants preferred a separation distance of 2300 ft (700 m) [21%], 5000 ft (1500 m) [14%] or a distance somewhere in between [18%].
- Comments on the questionnaire were typically supportive of wind development in the County. Many comments were tempered with calls to ensure that the Municipality takes caution to minimize the potential negative impacts of wind turbines.

Comments and questions were also received in the form of a formal public participation meeting presentation and Q&A period. The comments that resulted from the verbal portion of this meeting are similar to those received on the questionnaire. Participants were generally in favour of wind turbines in the County, but many speakers requested that care be taken to avoid negative impacts and ensure adequate setbacks. There was also a split in support for as-of-right and site-specific regulation.

3. Approach of other jurisdictions

In preparing the draft amendments, Staff researched the regulatory approaches to large-scale wind development in other jurisdictions, as summarized in Chart 1 on the next page. This chart reveals that an as-of-right approach is the most common. In this approach the Municipality allows large-scale wind turbines to be development through the permitting process in areas that are considered most appropriate.

There is a greater variance in what is considered an acceptable separation distance between wind turbines and residential dwellings. Where there are set distances, they range from 175m to 1000m. The Ontario Ministry of Environment has commissioned a study which concluded that at a minimum, the separation distance from a large-scale wind turbine to a residential dwelling should be 550 m¹.

Location	Regulation	Distance
Annapolis County	As-of-right within a Wind Resource Zone	No separation distance.
Antigonish County	Rezoning	Separation distance is 600 m (1960 ft) if <2MW and 1000m (3280 ft) if >2MW.
Cape Breton Regional Municipality	As-of-right	Separation distance is 575 ft (175 m) for turbines up to 250 ft (76 m) in height, 1 ft increase in separation distance for each 1 ft increase in height.
Colchester County	As-of-right	Separation distance is 700 m (2300 ft)
Digby County	As-of-right	Separation distance is 1000 m (3280 ft)
Halifax Regional Municipality (proposed)	As-of-right in rural areas	Separation distance is 550 m (1800 ft)
Municipality of East Hants	Site plan approval	Property line setback 4x height of turbine, unless an impact study shows a lesser or greater setback is required; noise at property line not to exceed 40 dBA or above existing background noise.
Municipality of West Hants	By development agreement outside Villages, Hamlets and Growth Centres	Separation distance is subject to impact studies.
Pictou County	As-of-right in Wind Zone	Separation distance is 600 m (1970 ft).
Ontario	Provincial Renewable Energy Approval	Wind facilities over 50kW generating a noise level of 102 dBA separation distance is 550 m; noise level of 106 dBA separation distance is 950 m.

Chart 1- Summary of regulatory approaches to large-scale wind turbine development

4. Provincial Approval

¹ Development of Noise Setbacks for Wind Farms: Requirements for Compliance with MOE Noise Limits, Ontario Ministry of Environment, September 2009.

An electrical generating facility which has a production rating of 2 MW or more derived from wind energy will require a provincial environmental assessment pursuant to the *Environmental Assessment Regulations* and Part IV of the *Environment Act*. An environment assessment is not always required as wind turbine projects can fall below the 2 MW threshold, at least in the initial stage. Environmental assessments are conducted to identify any impacts on human health and enjoyment of property, the natural landscape, plants and wildlife, soil and water, and other activities such as aviation and telecommunications. If negative impacts are identified, the design is adjusted to avoid or mitigate them.

As part of the environmental assessment process the Nova Scotia Department of Environment (DOE) requires the proponent to submit an Environmental Impact Statement (EIS). Copies of the EIS must be made available at public places such as community centres in the area where turbine development is proposed. DOE also requires the proponent to publish a notice in provincial newspapers stating where copies of the environmental assessment registration information may be reviewed. The proponent will often hold a public meeting in the area to receive comments from local residents before formally registering the project. DOE circulates the EIS to other government departments and agencies for their input.

5. Outline of Proposed Amendments

The rationale for allowing large-scale wind development in the County comes from the Municipality's Integrated Community Sustainability Plan (ICSP) and from the Provincial government's call for an increase in renewable energy throughout Nova Scotia. The proposed draft amendments (Appendix 'A') enable the development of large-scale wind turbines in most rural areas in the County. They aim to facilitate large-scale wind development in the most opportune locations: areas where there is a noted wind source, and areas that are generally compatible with primary resource development.

In the options report presented to the Planning Advisory Committee on April 27, 2010, Staff noted that large-scale wind development is most easily accommodated in rural areas where the potential for conflict with neighbouring uses can be mitigated. Within the rural districts, there tends to be low residential density and more available land. The Agricultural (A), Forestry (F) and Country Residential (CR) Districts were identified as the most appropriate locations for large-scale wind development. Upon further consideration of compatible districts, Staff believe that some areas within the Shoreland Districts may be appropriate for large-scale wind development, especially considering the location of good winds near some of the lakes on the South Mountain. For instance, while the Seasonal Residential (S1) Zone is primarily intended for residential and recreational development, there may some cases where these uses are not possible because of a lack of road access or unappealing shoreline conditions. Whereas other zones within the Shoreland District are focused on protecting shoreline or coastline resources, Staff believe that the Seasonal Residential (S1) Zone can accommodate large-scale wind development in some cases.

It has been noted by developers and Councillors alike that a more streamline approval process is generally preferred in Kings County. The majority of the public input received to date has indicated a public desire for a straight forward approval process for large-scale wind turbines. As indicated above, the as-of-right approach is most commonly used by other Municipalities within

Nova Scotia. Therefore, Staff believe that with the appropriate controls in place, large-scale wind turbines should be regulated through an as-of-right permitting process. Given that most wind developments with one or more turbines are subject to a comprehensive environmental assessment by the Province, Municipal regulations should be permissive while ensuring land use compatibility.

The proposed amendments set out the conditions placed on large-scale wind developments as regulated through the Land Use Bylaw. These conditions include adequate setbacks to property lines, public roads, watercourses and coastlines, minimum separation distances to neighbouring dwellings, controls on signage and appearance, and requirements for an emergency response plan and a decommissioning plan. Staff believe that an appropriate distance for the separation of wind turbines from neighbouring dwellings is 700 m. This distance provides a balance between the more modest distances (175 m to 350 m) and the more conservative distances (1000 m). A map analysis of the proposed 700 m separation distance shows that wind development would be possible in areas along the North and South Mountains where the wind resource exists and there is low development density (Appendix 'D').

Overall, the proposed requirements for large-scale wind turbines attempt to ensure public safety and minimize on and off-site impacts, while balancing the economics and viability of potential wind projects.

6. Staff Recommendation

Staff recommend that the attached MPS and LUB amendments permitting the development of large-scale wind turbines be forwarded to a second Public Participation Meeting. While PAC has already held a set of PPMs, the Public Participation Policy requires PAC to hold a PPM for the public to comment on the amendments. Therefore, another PPM is required. Staff also believe that given the nature of the amendments, further public input would be appropriate before forwarding them on to Council.

A tentative PPM date of Thursday, January 20th at 7pm in the Municipal Council Chambers has been scheduled. The snow date for this meeting has been tentatively scheduled for Wednesday, January 26th, same time and location.

7. List of Appendices

Appendix 'A' – Draft MPS and LUB amendments
Appendix 'B' – PPM minutes June 23/24, 2010
Appendix 'C' – PPM Questionnaire
Appendix 'D' – Proposed separation distance analysis map
Appendix 'E' – Letter from Scotian Windfields

DRAFT MPS AMENDMENTS

5.5 SITING OF LARGE-SCALE WIND TURBINES

With the political, economic, and ecological pressure to lessen dependence on fossil fuels for energy supply, communities throughout Atlantic Canada are looking at alternative sources of energy. Wind energy is expected to become an important source of renewable energy, as it has become an increasingly viable and abundant source of energy, particularly in Nova Scotia. Through the Municipality's Integrated Community Sustainability Plan (ICSP) Council has made a commitment to sustainability principles, in particular, the promotion of renewable energy development.

In seeking to provide opportunities for economic development, Council recognizes the benefits that large-scale wind development can have on individual property owners as well as the Municipality as a whole. By permitting large-scale wind development within the rural areas of the County, Council intends to strengthen the economic base of Kings County while also contributing to the Provincial renewable energy target.

Large-scale wind turbines, also known as utility-scale wind turbines, are those turbines which produce 100 kW or more per year. These wind turbines can be developed in groupings of two or more turbines, called wind farms, and are generally connected to the local distribution grid.

Council's aim is to provide opportunities for large-scale wind development where there is a known wind resource and where large-scale wind development is compatible with the surrounding land uses. The wind resource in Kings County is greatest in areas along the North and South Mountains. Therefore, Council will allow large-scale wind development in these rural areas of the County where the focus is on the protection and enhancement of natural resources and encouragement of primary resource development. Council intends to encourage wind development in a way that limits safety, noise and visual impacts on neighbouring uses. This will be achieved by requiring minimum setbacks and separation distances between large-scale wind turbines and neighbouring dwellings.

5.5.1 Large-Scale Wind Turbine Objectives

- 5.5.1.1 To promote the development of large-scale wind turbines in an effort to reduce the Municipality's dependence on non-renewable energy.
- 5.5.1.2 To respond to the Provincial call for increased sources of non-renewable energy.
- 5.5.1.3 To minimize the potential negative impacts of large-scale wind turbines on neighbouring land uses and to ensure an acceptable standard of safety and compatibility.
- 5.5.1.4 To maintain consistency with and support the rural goals of the Strategy.

5.5.2 Large-Scale Wind Turbine Policy

- 5.5.2.1 Council shall provide for the siting of large-scale wind turbines within certain zones in the Agricultural (A), Forestry (F), Country Residential (CR), and Shoreland (S) Districts.
- 5.5.2.2 Council intends to regulate the placement and appearance of large-scale wind turbines to mitigate any potential negative impact they may have on neighbouring residential uses and the environment. Therefore, the Land Use Bylaw will include the following provisions:
- a. minimum required setback from property lines, public rights-of-way, watercourses and coastlines;
 - b. minimum required separation distance from dwellings on neighbouring properties;
 - c. other minimum requirements focussed on ensuring the safety of the development;
 - d. controls for signage and turbine appearance; and
 - e. requirement of an emergency response plan and a decommissioning plan.

DRAFT LUB AMENDMENTS

- 1.157 **Wind Turbine** means a turbine that converts the wind's kinetic energy into either electrical power or mechanical energy. The turbine comprises the tower, rotor blades (either vertical or horizontal) and nacelle.
- 1.157.1 **Blade Clearance** means the distance between the bottom tip of the rotor blade and the ground.
- 1.157.2 **Climbing Apparatus** means the ladder located on the turbine tower used for climbing and maintaining the turbine.
- 1.157.3 **Decommissioning** means the final closing down of a wind generation development or project or the point at which an individual wind turbine or grouping of turbines have reached the end of their operational life and the process by which the site is restored to an agreed use or condition.
- 1.157.4 **Kilowatt (kW)** means a measure of power for electrical current (1kW = 1,000 watts).

- 1.157.5 **Large-scale Wind Turbine** means a wind turbine that has a rated output capacity greater than 100 kilowatts. Power-generating large-scale wind turbines primarily connect and provide power to the local utility grid.
- 1.157.6 **Nacelle** means the frame and housing at the top of the tower that encloses the gearbox and generator and protects them from the weather.
- 1.157.7 **Rotor Blade** means the part of the wind turbine that rotates in the wind and extracts kinetic energy from the wind.
- 1.157.8 **Small-scale Wind Turbine** means a wind turbine that has a maximum rated output capacity of no greater than 100 kilowatts. Power-generating small-scale wind turbines primarily provide power for on-site usage.
- 1.157.9 **Wind Turbine Height** means the height from grade to the highest vertical extension of a wind turbine which often occurs at the top of the arc of the rotor blade.
- 1.157.10 **Wind Turbine Tower** means a freestanding structure or a structure attached to guy wires that serves to support other parts of the wind turbine.

10.1.6 **Siting of Large-Scale Wind Turbines**

- 10.1.6.1 One or more Large-Scale Wind Turbines shall be permitted in an A1, F1, R6 or S1 Zone subject to the following:
- a. the blade clearance shall be a minimum of 25 feet.
 - b. the minimum separation distance between wind turbines shall be equal to or exceed the height of the tallest turbine.
 - c. the wind turbine shall be setback a minimum of 1.5 times the turbine height from rear, front and side lot lines, public rights-of-way, watercourses and coastlines.
 - d. where a lot located immediately adjacent to and abutting a lot where a large-scale wind turbine is to be erected will be used for wind turbine development and the turbines on both properties will be connected to the same array, the setback requirement (contained in Section 10.1.6 c.) from the shared property line shall be waived.
 - e. the wind turbine shall be located a minimum of 2300 feet (700 m) from any dwelling on a neighbouring property. This separation distance may be waived for a dwelling on the same property on which a large-scale wind turbine(s) is installed;
 - f. Notwithstanding 10.1.6.1 e. above, where a dwelling is constructed within the required separation distance of a large-scale wind turbine development, the wind turbine development may expand. The required

separation distance for any expansion shall be equal to or greater than the separation distance between the initial wind turbine development and the dwelling.

- g. the wind turbine shall be finished in a non-reflective matte and in an unobtrusive colour;
- h. the only artificial lighting permitted on the wind turbine is lighting that is required by federal or provincial regulation;
- i. no signage shall be permitted on the wind turbine except that of the manufacturer's identification;
- j. The owner(s) of the land on which the wind turbines are located shall notify the Municipality of Kings County within one (1) year of wind turbine inactivity and shall remove the wind turbines and associated infrastructure within two (2) years of wind turbine inactivity.

10.1.6.2 Upon application for a development permit for a large-scale wind turbine, the developer shall submit the following documentation:

- a. the project definition including installed turbine(s) capacity, targeted long term production levels, scale elevations or photos of wind turbines showing total height, tower height, rotor diameter and colour;
- b. a site plan showing all buildings, roads, boundaries, natural features and alterations of site;
- c. wind turbine manufacturer's specifications and professional engineer's design an approval of turbine base(s);
- d. copies of all documentation required for *Canadian Environmental Assessment Act* and *Nova Scotia Environment Act* and regulations, if applicable;
- e. evidence of notification to and approval from DND, Nav Canada, Transport Canada or other applicable agencies regarding potential radio, telecommunications and radar interference, if applicable;
- f. an emergency response plans for site safety;
- g. a decommissioning and reclamation plan; and
- h. any other information the Development Officer deems necessary to determine whether the development conforms to this Bylaw.

Appendix 'B' – PPM minutes June 23/24, 2010

**PLANNING ADVISORY COMMITTEE
PUBLIC PARTICIPATION MEETING
Large-scale Wind Turbine Policy Options
(File F-3-153)**

Meeting, Date and Time	The Planning Advisory Committee held a Public Participation Meeting on Wednesday, June 23, 2010 at 7:00 p.m. at the Aylesford Fire Hall, 1083 Park Street, Aylesford, NS.
Attending	In Attendance:
PAC Members	Chairperson Deputy Warden Diana Brothers – District 6 Janet Saunders – Citizen Member
Regrets	Merrill Ward – Citizen Member
Councillors	Councillor Wayne Atwater – District 5
Staff	Leanne Chisholm – Planner Ian Watson – Planning Intern Heather Archibald – GIS Technician Cindy Barker – Recording Secretary
NS Department of Energy	Ross McLaren
Eco-Kings Action Team	Jennifer Weisner – Development Officer, Kings Regional Development Agency (RDA)
Public	14 Members
Welcome and Introductions	The Chairperson, Deputy Warden Brothers, called the meeting to order and introduced the members of the Planning Advisory Committee, Staff, attending Councillor, NS Department of Energy Representative, Eco-Kings Action Team Representative, and welcomed the members of the public to the meeting. The Chair explained that the purpose of the meeting was to solicit public input on the policy options for regulating large-scale wind turbines in the County.
Presentation	Leanne Chisholm presented a power point presentation on the proposed Large-scale Wind Turbine Policy Options. At its April 27, 2010 meeting, the Planning Advisory Committee reviewed the Staff report and the following options. Staff recommended Option B and the Committee forwarded Option B onto a Public Participation Meeting. A. Allow large-scale wind turbines through a streamlined process guided by set standards. This may be achieved by as-of-right permitting or through site plan approval.

- B. Allow large-scale wind turbines through a site-specific process such as a rezoning.
- C. Allow large-scale wind turbines through a streamlined process in areas determined to be most suitable for large-scale wind turbines, and through a site-specific approval process in other areas of the County.
- D. Maintain the Status Quo.

Ms. Chisholm explained that the purpose of the Public Participation Meetings is to gather input. No policies have been written at this point. Input will be used in drafting specific requirements for the siting of large-scale wind turbines. The community will have an additional opportunity to comment on the draft policies, once written, at the time of public hearing.

Following Ms. Chisholm's presentation, the floor was opened for comments from the public.

***Comments from
the Public***

David Lacey

- Option B adds a level of complexity to the selection process of siting wind turbines that is not conducive to the actual process by which they must be set up.
- In most cases, in order for wind turbines to be cost effective they have to be set up in a group. One detractor in one place could jeopardize the whole project.
- Would prefer Option A or Option C which would allow wind turbines to exist in any zone once the criteria is in place. Once criteria is established and the setbacks are in place there is no reason to further complicate the matter by going with Option B. Option C, where you actually create areas that are pre-designated, also seems like a good plan or a combination of Option A and Option C. Option B is going to be a mess.

Bill Lyons

- Are you talking about large scale turbines or just a large single turbine?

David Lacey

- When a large wind turbine farm is generally set up they have to be in a group. When looking at the cost of installing the infrastructure to deliver the electricity, the economies of scale is not there if you have individual turbines unless you happen to be close to a grid where it can be distributed. If every single location is going to have to be approved, wind developers are going to go somewhere else.

Heather Stephens

- Thanked the two Councillors for being in attendance. Questioned why there were not more Councillors at the meeting given the importance of the topic.
- Questioned why it has taken so long for Kings County to begin to act on this topic because the County spoke of sustainability back in

2006 and the Province has had in place the Best Practices Bylaw document in which they said that they would like to work closely with municipal councils to develop this kind of bylaw.

The Chair responded that the project has been on the project list for some time but only now is going through the process taking into account the number of projects that were prioritized.

Councillor Atwater stated that the study carried out by Dalhousie University also added to the time frame.

Heather Stephens

- Will probably be acceptable if both sides are still not happy with it.

The Chair explained that the Planning Advisory Committee is looking at the current process of soliciting public input. It is being proposed that information be taken to the public for input with only the options being presented. There would be no staff recommendation presented.

Heather Stephens

- Happy to hear that this is the route you plan to go. Would support changing the way you solicit public input.
- Can't emphasize enough the benefits to our economy and to the environment of looking at this seriously and having something in place.
- Really disappointed to see that the Planning Advisory Committee forwarded Option B onto a Public Participation Meeting. Seems to say to the public that you will let us have some participation as long as it is Option B. It does not really speak to public participation.
- Option A or C makes more sense. Option B would become bogged down if the Council had to look at each one individually.

Leanne Chisholm responded that Option B is only a preliminary recommendation and that the Committee wishes to hear what the public has to say. The recommendation can change very easily.

The Chair stated that the Councillors are attending many meetings throughout the County. Staff did their best to inform the County residents of the meetings through the local media and the 7 Villages were notified.

Bill Lyons

- Do all the 55 municipalities in the Province look at different regulations for the siting of large-scale wind turbines?
- Provincial leadership is needed on this issue.
- The burden should not be on individual councils; there needs to be provincial leadership. The municipalities should develop regulations and forward one package to the Province for its review so all municipalities are governed the same.

The Chair stated that it would take a long time to get all the 55 municipal units to come to an agreement. Kings County needs to go forward with its

project. Once the document is approved, it could be sent to the Union of Nova Scotia Municipalities to inform them of the County regulations.

David Lacey

- Already stated that large-scale wind turbines should be allowed by "right" in any zone as long as setbacks are recognized. They should not have special zoning. This would facilitate easy site selection and swift construction in any area without an onerous zoning process being put in place.
- Setbacks should be minimal, 1000 metres or less, for habitation and closer upon agreement with consenting landowners.
- There be no onerous tax barriers to such construction and operation of large-scale wind turbines and that these tax agreements be in place and guaranteed for the expected term of operation of the turbines, which is generally about 20 years.
- That the County designate reasonable supply corridors for wind farms so that the electricity generated can be marketed efficiently.
- That the County recognize the obvious "green" benefits of such large-scale wind turbines and develop a public education and support program for the industry in Kings County.
- That Kings County become a model for wind power development in Canada through its progressive thinking, planning and swift implementation of guidelines for such structures.
- This form of clean, renewable energy definitely has a place in Kings County.
- Hopes that this device will be powered by a clean large-scale wind turbine rather than imported oil and coal.
- A 20 year progressive plan should be implemented so the industry and stakeholders have a firm grasp on what the future holds for wind power in Kings County. Would like the County to be known as the "Kings of Clean Energy in Canada".

Murray Conlin

- Asked for more information on small-scale wind turbines.

Leanne Chisholm stated that the County already has regulations for small-scale wind and offered to make them available.

Bill Lyons

- Asked for an example of the time frame involved in the process that a wind developer would have to go through in Option A, B and C.

Leanne Chisholm explained the following:

Option A - "as-of-right" – once Council has established standards, the developer would come to the County office, apply for a permit, and assuming that all required information is provided, a permit could be obtained within a month.

Option B – site specific approval process such as a rezoning or development agreement – 4-6 months for approval time because process involves public consultation and council decision.

Option C would be a combination of the two (Option A and B).

Ms. Chisholm further explained that each property owner would have to come in for a permit for however many turbines to be put up. It could also be done on a project scale where a few property owners come forward with, for example, a rezoning proposal that could be done through one process, not multiple months for each individual turbine.

David Lacey

- One person could hold up or extend the process indefinitely. Wind farm developers are going to go where they can put up the turbines and put them into business.

Leanne Chisholm responded that it would be the decision of Council whether or not to hold up the process. Council makes its decision on the input received.

Councillor Atwater asked for clarification on what small-scale wind turbines entail.

Ms. Chisholm stated that a small-scale wind turbine is defined as a turbine that has a maximum rated output capacity of no greater than 100 kilowatts and is not higher than 170 feet in height. Power-generating small scale wind turbines primarily provide power for on-site usage. Utility scale turbines greater than 100 kilowatts are generally capable of powering hundreds of houses.

Nancy Kelly

- Questioned the Nova Scotia Utility and Review Board process if there are issues with decisions that have been made and if it would apply to Option B and C.

Leanne Chisholm responded that the Municipal Government Act allows aggrieved persons to appeal a decision of Council pertaining to Land Use Bylaw amendments, i.e, rezonings, text amendments and development agreements. Option A and areas of Option C that are done as-of-right would not be appealable.

Ron Mills

- Would a dairy farmer come under the proposed regulations for large-scale wind turbines if he/she only wanted to put up one turbine on his/her field?

Ms. Chisholm explained that any wind turbine that has a rated output capacity of greater than 100 kilowatts is determined to be a large-scale wind turbine and would fall under the new regulations, whatever they might be. Multiple wind turbines less than 100 kilowatts are all considered small-scale and are regulated under the County's small-scale wind turbine policies.

Ross McLaren

- What are the potential benefits for having large-scale wind turbines in the County?

Ms. Chisholm explained that part of the rationale for allowing large-scale wind turbines is to reduce the carbon footprint in the County and the reliance on fossil fuels. It is a great opportunity to become more sustainable as a community by encouraging this type of renewable energy. It also provides an economic benefit for landowners. The landowners could lease their land to a wind farm developer and reap the benefits from the lease money. In the agricultural district, it would provide an opportunity for farmers who may want an alternate income source. Because the wind turbines tend to have a small footprint, farmers are able to have them on their farms and still produce crops. Municipalities would benefit from an increased tax base.

Charles Scary

- Are there any guidelines and/or studies showing that large-scale wind turbines would be good for the County?

Leanne Chisholm stated that one of the wonderful resources that municipalities in Nova Scotia have at their disposal is the "Model Wind Turbine Bylaw" document, a joint venture between the Union of Nova Scotia Municipalities and the Provincial Department of Energy. The document shows what other jurisdictions are doing, what has and has not worked, and what options are available to our municipalities. The document has been used as a key source of information in establishing what the County of Kings has come up with today.

Ross McLaren stated that he is very impressed by the quality of the material provided.

David Lacey

- Inquired if the illustrations provided at the meeting will be posted on the County website.

Leanne Chisholm advised that she would have the illustrations posted by the end of the week and have them linked to the scrolling information on the County's main webpage.

Adjournment

There being no further comments from the public, the Chairperson adjourned the meeting at 7:50 p.m.

Approved by

Deputy Warden Brothers
PAC Chairperson

Cindy L. Barker
Recording Secretary

**PLANNING ADVISORY COMMITTEE
PUBLIC PARTICIPATION MEETING
Large-scale Wind Turbine Policy Options
(File F-3-153)**

<i>Meeting, Date and Time</i>	The Planning Advisory Committee held a Public Participation Meeting on Thursday, June 24, 2010 at 7:06 p.m. at the Canning Fire Hall, 2232 North Avenue, Canning, NS.
<i>Attending</i>	In Attendance:
<i>PAC Members</i>	Chairperson Deputy Warden Diana Brothers – District 6 Vice Chairperson Councillor Mike Ennis - District 12 Councillor Eric Smith – District 12
<i>Regrets</i>	Councillor Janet Newton – District 2 Councillor Dick Killam – District 3 (arrived during adjournment of meeting) Merrill Ward – Citizen Member
<i>Councillors</i>	Councillor Jim Taylor – District 1
<i>Staff</i>	Leanne Chisholm – Planner Ian Watson – Planning Intern Heather Archibald – GIS Technician Cindy Barker – Recording Secretary
<i>NS Department of Energy</i>	Ross McLaren
<i>Public</i>	25 Members
<i>Welcome and Introductions</i>	The Chairperson, Deputy Warden Brothers, called the meeting to order and introduced the members of the Planning Advisory Committee, Staff, attending Councillor, NS Department of Energy Representative, MLA Jim Morton, and welcomed the members of the public to the meeting. The Chair explained that the purpose of the meeting was to solicit public input on the policy options for regulating large-scale wind turbines in the County.
<i>Presentation</i>	Leanne Chisholm presented a power point presentation on the proposed Large-scale Wind Turbine Policy Options. At its April 27, 2010 meeting, the Planning Advisory Committee reviewed the Staff report and the following options. Staff recommended Option 2 and the Committee forwarded Option 2 onto a Public Participation Meeting. <ol style="list-style-type: none"> 1. Allow large-scale wind turbines through a streamlined process guided by set standards. This may be achieved by as-of-right permitting or through site plan approval.

2. Allow large-scale wind turbines through a site-specific process such as a rezoning.
3. Allow large-scale wind turbines through a streamlined process in areas determined to be most suitable for large-scale wind turbines, and through a site-specific approval process in other areas of the County.
4. Maintain the Status Quo.

Ms. Chisholm explained that the purpose of the Public Participation Meetings is to gather input. No policies have been written at this point. Input will be used in drafting specific requirements for the siting of large-scale wind turbines. The community will have an additional opportunity to comment on the draft policies, once written, at the time of public hearing.

Following Ms. Chisholm's presentation, the floor was opened for comments from the public.

***Comments from
the Public***

Kim MacQuarrie

- Wondered if areas that won't be considered were looked at such as the fragile ecosystems like Cape Split.

Leanne Chisholm stated that based on the initial review, it is being proposed to eliminate areas in the urban zones, areas where the County promotes development and growth. Staff are also proposing not to consider the Environmental Open Space Zone (dykelands and wetlands). Structures are not allowed on floodplains or on steep slopes. Areas such as Cape Split are not immediately on the radar to be eliminated. Option 2 provides the opportunity at the site specific approval level to have an environmental analysis carried out.

Paul Gervason

- Is the County aware of any evident interest by wind farm companies that want to go in this direction?

Leanne Chisholm stated that interest has been expressed and that this is part of the reason why the County is moving forward with these policies.

Bobby Foley

- Was approached by people wanting to put a windmill on their land in Halls Harbour. It was not worthwhile financially to relinquish the land or the rights to it.

Richard Stern

- The developers of the windmills, is the Province involved or are they private companies? If so, would they actually have to buy land or would land be expropriated? If land was bought, would they be offering a fair market value?

David Lacey

- In the case of the leases that are standing now, one company has leased thousands of acres on the North Mountain, as a preliminary move to possibly put wind farms here. The land is leased from the property owner, it is not purchased. It does not affect any other existing use on the land. They only care about the land at the base of the unit and the access in and out. The actual amount of money that actually comes to the landowner works out to be somewhere between \$8,000 to \$12,000 per year per unit. Very few wind farmers actually acquire land; land is leased because it is less expensive and puts money back into the community. The turbines are expected to operate for about 20 years.
- Nova Scotia Power published information on noise from wind turbines. The design of the wind turbines has advanced dramatically and virtually all the mechanical noise has been eliminated. The new curve blade design is very quiet, about 5 decibels at a distance of 1,000 feet.
- The thinner blades give less of a flicker effect and there is far less bird kill.
- Technology has changed and is advancing every day.
- Wind turbines are not stand alone devices. They need to stand as a group to be cost effective (10 to 20 units standing in proximity to each other to allow the electricity to be fed into a single corridor and then off to the grid). This is where Option 2 becomes problematic.
- Once the County establishes inflexible, firm guidelines that wind turbines should be erected under, they should be allowed by right in the districts where they would be most effective. The crest of the North Mountain where there is consistent wind would be a perfect location for wind turbines, not the valley where the wind is too irregular.
- Having each single wind turbine, set up in a row on maybe several properties, go through individual development agreements or rezoning, would be an onerous and costly process. Each unit costs about \$2 million dollars. Wind developers would want their money coming back as soon as possible. It would be ideal for wind farm developers to come to a County to invest their money where corridors are already in place. We will be producing our power here cleanly and efficiently.

Richard Stern

- Asked where the leased land for potential wind turbines is situated.
- It is a matter of opinion on whether or not wind turbines are considered beautiful and he does not think that they are.
- Is in support of a policy.

David Lacey

- There are tens of thousands of acres leased all along the Brow of the North Mountain.

Rick Whitman

- Basically very favourable towards wind turbines.
- Supported Option 2 in the questionnaire.
- In a multi tower site, doubted that a permit would be required for every single tower. Would entertain an application for a 20 unit installation would be considered as an individual installation. It is really important to make that difference in the application process.

The Chair responded that Mr. Lacey is talking about having an individual(s) speaking against one or two individual site locations in a project which may prevent a project from going forward, or may cause long delays.

Leanne Chisholm stated that if it was one project it would be evaluated as the same permitting process but all would have to meet the criteria. They get individual approvals but it is the same process of approval as from one proponent. All individual pieces of land for a wind farm would go through the same rezoning process as multiple pieces of land not individual rezoning processes.

Heather Stephens

- Supports the least restrictive options.
- Option 2 would be a nightmare especially with the patchwork scenario.
- Asked what approaches have been taken by the other municipalities for the installation of wind turbines development indicating that Kings County is really behind.

Leanne Chisholm reviewed the policies on how other municipal units permit the installation of wind turbines stating that there are as many different approaches as there are municipalities in the Province and that some of them are more straightforward than others..

Bruce Scott

- What will be the price of the electricity coming off a typical wind farm?

Ross McLaren stated that over the long term adding renewable energy will give us the lowest cost price for electricity. Right now wind power is the most cost effective renewable energy technology on the market place.

Bobby Foley

- When talking about the crest of the North Mountain being the most optimum point, it is a peak and goes down close to the shoreline. People between the crest and the shoreline have the luxury of looking at the bay. Where is the compensation for those folks who will have to look through a windmill to see their view?

David Lacey

- Very stringent criteria needs to be developed requiring decibel output, clearances and the setbacks be clearly defined which should

alleviate any concerns. If you look at the areas where wind turbines can be located, even with the most minimum setback, there are very few areas where a wind farm can be set up which will be large enough to be cost effective because there are people close by. By nature they will be away from populated areas. It is highly unlikely you will see them from your house unless you choose to do so.

Leanne Chisholm stated that Option 2 is site specific and allows for public input on things like what is the comfort level of the community on this proposal. It may make it a longer process but it would address such concerns where a streamlined process may not address things like the visual impact. There may be certain areas that are more appropriate for a streamlined process than others. Some areas are more willing to have wind turbines than others (Option 3 or a combination).

Everett Rand

- Is in favour of the large-scale wind farms.
- There is nothing too offensive about a windmill.
- Option 1 would be appropriate.

Ross McLaren reported that the Province has released its *Renewable Electricity Plan* and there are opportunities for municipalities, community groups and non-profits to benefit from a Feed-in Tariff which may result in these types of groups building a single 1.8 megawatt wind turbine. There will also be opportunities for farmers to set up devices that are even bigger than 100-150 kilowatts.

Rick Whitman

- The main debate seems to be between Option 1 and Option 2.
- Has difficulty understanding why any large undertaking involving between 5-20 turbines would have any problem with a permitting process under Option 2.

The Chair explained the process that had ensued over the application to site cell towers on the North Mountain. Council approved all the towers except the one at Victoria Harbour due to public concerns. Not having all turbines approved at once would impact the project.

Leanne Chisholm stated that Council can approve a portion of a project and not the remainder.

Rick Whitman

- Appreciated the example but argued that the placement of wind turbine towers is going to be very different from the placement of cell phone towers. Cell phone towers need to be scattered individually over the county for sufficient coverage. Wind turbines are going to be largely installed in groups of 5-10-20 more or less on the same site or contiguous site made up of individual parcels of land, all within a few hundred metres of each other. Is an individual installation of towers at one site.

- Inquired if when Nova Scotia Power wants to build a new substation in the County do they not have to go through something like Option 2 or is it done basically with a building permit.

Leanne Chisholm responded that the Nova Scotia Power Corporation would be subject to the same bylaws as anyone else. A substation is a use and would have to be permitted in the zone.

Roy Corkum

- Is in favour of wind farms.
- There has been so much red tape in getting these things approved.
- The biggest thing to do is to get the policies streamlined and simplified.
- They should be allowed to happen.
- Agrees with both Option 1 and Option 2.

David Lacey

- In speaking of Option 1, have a public consultation process where stringent rules are formed under which large-scale wind turbines can exist. Have the public consultation process beforehand to set the setbacks and have everything in place so there is no opportunity for negative feedback.
- Option 1, Number 5 is the way to go.

Richard Stern

- Favours Option 2.

Nigel Thornley

- Engineering background. Spent most of working life developing internet technology. Looking towards where we are going in the next 10-15 years from now. Very much supports renewable energy but has some reservations about these types of windmills, horizontal axis turbines.
- Wants none of the regulations written today to affect other types of windmills because they are quite different – vertical axis windmills.

Leanne Chisholm stated that currently under the definition of small-scale wind turbines both vertically and horizontally rotating blade turbines are allowed. A similar broad definition would be used to define a large-scale wind turbine not prohibiting any other style of turbine.

Nigel Thornley

- The vertical axis turbines do not interrupt the skyline.
- They can function in a much broader range of wind speeds.
- The turbines could be successfully employed in other areas.
- Sees this as the future where we are going – keep the door open.

Ms. Chisholm stated that it could be distinguished in the policies between the vertical and horizontal style turbines.

Adjournment There being no further comments from the public, the Chairperson adjourned the meeting at 8:02 p.m.

Approved by

Deputy Warden Brothers
PAC Chairperson

Cindy L. Barker
Recording Secretary

Appendix 'C' PPM questionnaire



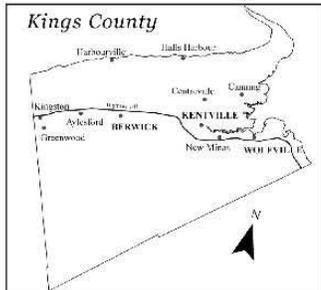
Municipality of the County of Kings

Planning Advisory Committee - Public Participation Meeting (PPM)

Wednesday, June 23, 2010
 Aylesford Fire Hall,
 1083 Park Street, Aylesford

Thursday, June 24, 2010
 Canning Fire Hall
 2232 North Avenue, Canning

Large-scale Wind Turbine Policy Options—Questionnaire



The Municipality of the County of Kings is currently developing policy to guide the development of large-scale wind power in the County. Your feedback is crucial in shaping this policy. The questions asked in this questionnaire are generally related to, and informed by, the posters on display. Please complete this questionnaire to the best of your abilities and drop it off in the provided box.

Where do you live (town or community name)?

Poster 1—Background

The Nova Scotia government has announced that by 2020, 40% of the province's electricity will come from renewable sources. Do you see wind power as a viable option in achieving this goal? Yes No

Explain: _____

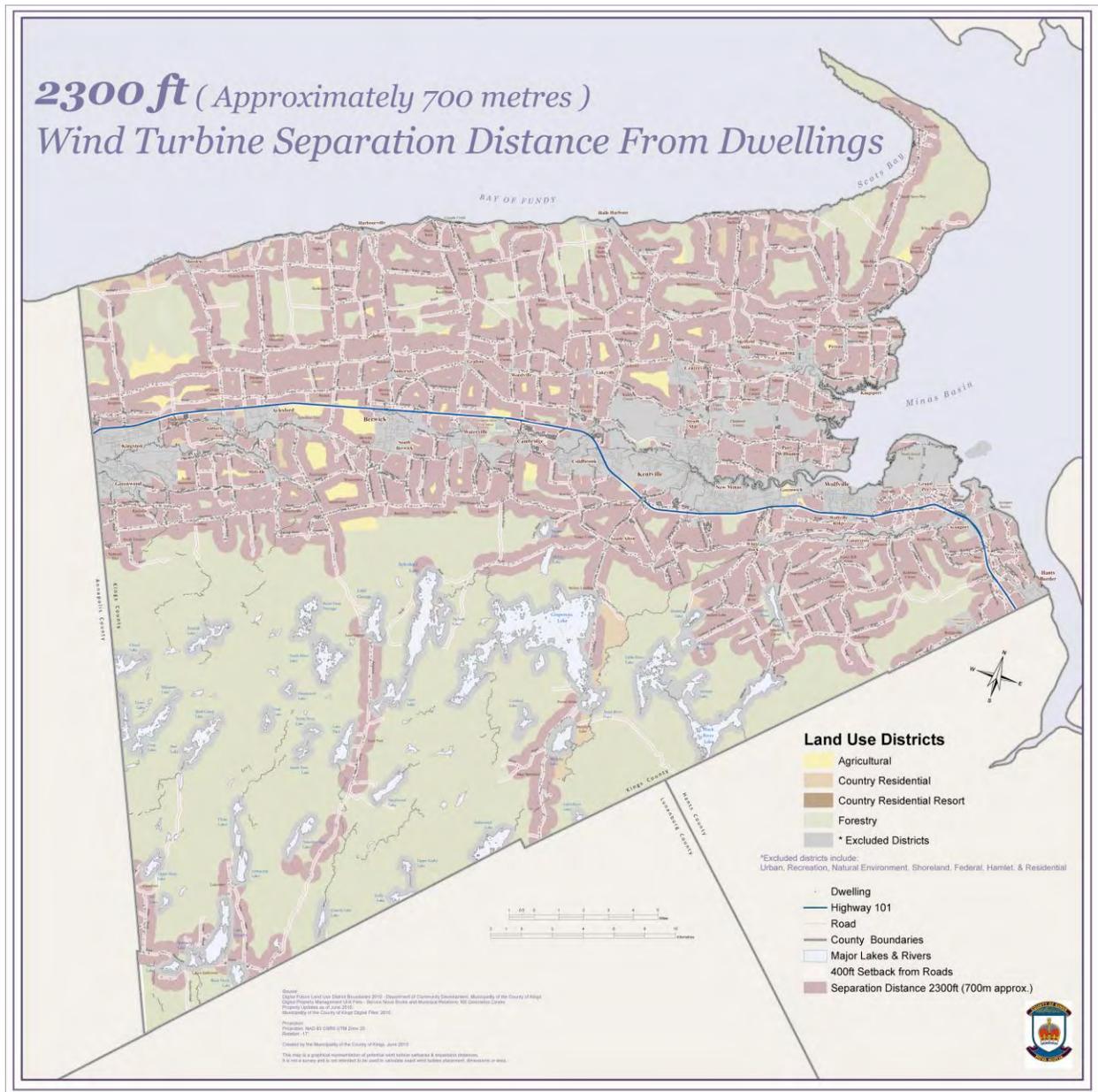
Poster 2—Impacts

Please identify which potential wind impacts are of concern to you:					
	No Concern	Mild Concern	Medium Concern	Strong Concern	Extreme Concern
Noise					
Aesthetics					
Safety					
Shadow Flicker					
Natural Environment					
Other _____					
Other _____					

Are you comfortable with a "1x turbine height" safety setback from roads and property lines?
 Yes No If "No", what setback would you be comfortable with? _____ X

SEE OVER →

Appendix 'D' – Proposed separation distance analysis map



Appendix H – March 29th, 2011 Post PPM report to the Planning Advisory Committee, “Amendments to the Municipal Planning Strategy and Land Use Bylaw for the siting of large-scale wind turbines”



Municipality of the County of Kings

Post PPM Report to the Planning Advisory Committee
Amendments to the Municipal Planning Strategy and Land Use Bylaw for the
Siting of Large Scale Wind Turbines

March 29, 2011

Prepared by Leanne Jennings, Planner

1. Introduction

On April 27th, 2010, the Planning Advisory Committee (PAC) reviewed a Staff report which provided background information on large-scale wind turbines including their potential positive and negative impacts. The report also outlined a variety of ways in which large-scale wind turbines could be regulated in the County. These regulatory options were presented at two Public Participation Meetings held on June 23rd in Aylesford and June 24th in and Canning.

Based on the input received at the public meetings, Staff drafted large-scale wind turbine policies and presented the draft amendments to the Planning Advisory Committee on December 14th, 2010. PAC reviewed the draft amendments and passed a motion reducing the required setback from 1.5x to 1x, the height of the wind turbine, and reducing the separation distance from a neighbouring dwelling from 700 m to 600 m. PAC forwarded the revised draft amendments on to another Public Participation Meeting. At the Public Participation Meeting held on January 20, 2011, PAC received feedback from the public on the draft amendments. The draft minutes of this meeting are attached as Appendix B.

On Tuesday, March 8th members of Municipal Staff, PAC and Council travelled to the site of the Digby Wind Park. While on the tour the group met with Paul Warren, Manager, Wind Energy and Combustion Turbines for Nova Scotia Power Inc., Linda Gregory, Warden of the Municipality of the District of Digby and Linda Fraser, CAO of the Municipality of the District of Digby.

2. Input from the Public

There were 25 members of the public present at the Public Participation Meeting held on January 20, 2011. In addition, a number of email submissions were received around the time of the PPM. There were those at the public meeting that both support the proposed amendments and those that believe more caution should be taken when regulating wind turbines. Staff have compiled new information based on some of the concerns that came out of the public input.

Wildlife Concern

One member of the public had a concern that wind turbines might have a negative impact on eagles. Staff brought this concern to the attention of Mark Elderkin, Species at Risk Biologist

with the Department of Natural Resources. Mr. Elderkin stated that through the provincial environmental assessment approval process for wind developments 2MW and greater, impacts on wildlife are studied and required to be mitigated. In addition, he indicated that one of the requirements of the EA approval is for the proponent to conduct a 2 year post construction bird and bat monitoring program. Of the developments that he has reviewed, he has found that the mortality rate in birds and bats has been negligible.

Health Concern

Some of the input received from the public has expressed concern regarding the potential health impacts of wind turbines. Staff conducted further research on this issue and found that there are predominantly two schools of thought on the topic. There is one set of research which states that while some residents living near wind turbines suffer from some ailments, including sleep disturbance, there are no scientific studies that have drawn a causal relationship between the presence of wind turbines and physical health effects on nearby residents. On the other hand, another set of research proposes that health effects from wind turbines is biologically plausible, and while the causal pathway may not yet be known, the particular form of distress that has been observed is not something that often suddenly occurs without some observable proximate cause. Staff at the Environmental Assessment Branch of Nova Scotia Environment were contacted to comment on this issue. They indicated that Health Canada is conducting studies to provide some clarity on the issue. The results of these studies are not yet available to the public.

Waiving the required separation distance

One member of the public suggested that a neighbouring property owner should have the option of waiving the required separation distance between a wind turbine and their residential dwelling. Staff discussed this possibility with the Municipal Solicitor, Mr. Muttart, to see if there is a legal mechanism to allow this proposed provision. Mr. Muttart indicated that the Municipal Government Act does not allow for a neighbouring property owner to permit the waiving of a land use bylaw requirement.

3. Digby Wind Park Tour

One of the highlights of the wind park tour was the information provided by Paul Warren, Manager, Wind Energy and Combustion Turbines for Nova Scotia Power Inc. Mr. Warren gave us a tour of the site and explained some of the history and logistics of the wind park. Many of the participants noted that the wind turbines produced less noise than they anticipated. Some found it valuable to see what shadow flicker is like and to hear Paul talk about ice throw impacting on-site infrastructure.

The group also met with the Warden and CAO of the Municipality of the District of Digby who discussed with us their experiences regarding wind development. Ms. Fraser and Ms. Gregory indicated that during the process of developing their wind turbine policies, there were two distinct sides- those that supported wind development, and those that did not. In creating their policies, Digby Council aimed to achieve a compromise between the two sides. They both stated that they believe Digby's policies are a reasonable compromise- a setback of 750 m from a property line and a separation distance of 1000 m from an existing dwelling.

4. Changes to the Amendments

Staff have further refined the draft amendments based on public input and additional research. Some of the changes involve a few minor wording changes based on input from our Solicitor, industry professionals, and development officers to ensure that the wording within the policy is as accurate and clear as possible. The changes are as follows:

- The requirement for one times the height of the wind turbine setback from watercourses has been removed as this provision was deemed overly restrictive and had the potential to severely limit the siting of wind turbines in the county. Rather, the existing requirement in the LUB for all structures to be located a minimum of 50 feet from the top of a bank of a watercourse will apply.
- A provision has been added that will allow wind developments on properties that do not have frontage. Large-scale wind projects are often developed on a number of different properties through lease agreements. It would not be necessary for the property on which the wind turbines are located to have road frontage.
- A provision restricting the siting of large-scale wind turbines within the Grand Pré plan area was added so that the policy is consistent with the Grand Pré Community Plan.
- A definition of Wind Monitoring (Meteorological) Tower was added and regulations permitting this use were included to allow wind developers to measure wind speeds at different locations throughout the county.
- A few words from the small-scale wind turbine regulations were removed and the definition of Small-scale Wind Turbine was changed slightly to ensure consistency.

5. Conclusions

Staff gave serious consideration to the potential impacts of large-scale wind turbines on wildlife and humans. Staff have determined that the provincial environmental assessment approval process for wind projects which generate 2MW or more is comprehensive enough to address these complex issues. For larger wind developments, the setbacks and separation distances enforced by the Municipality should simply aim to achieve land use compatibility. For projects which generate less than 2 MW, Municipal policies provide the only siting restriction to wind development. In these cases, Council should ensure that required setbacks and separation distances not only achieve land use compatibility, but they address potential safety and nuisance issues such as ice throw, shadow flicker, and noise impacts.

6. Staff Recommendation

Overall, Staff believe that the draft amendments contained in Appendix A achieve the goal of promoting large-scale wind development in the county, while minimizing their potential negative impacts on neighbouring land uses. While the draft amendments reflect PAC's direction to reduce the separation distance between large-scale wind turbines and residential dwellings to 1968 feet (600 m), Staff continue to recommend a 2300 feet (700 m) separation distance as a slightly more cautious approach. Staff believe that this distance will achieve the goal of land use compatibility in larger scale projects, while protecting against safety and nuisance issues for smaller projects which are not subject to provincial environmental assessment.

DRAFT MPS AMENDMENTS

1. Insert the following section after section 5.4 of the Municipal Planning Strategy

5.5 SITING OF LARGE-SCALE WIND TURBINES

With the political, economic, and ecological pressure to lessen dependence on fossil fuels for energy supply, communities throughout Atlantic Canada are looking at alternative sources of energy. Wind energy is expected to become an important source of renewable energy, as it has become an increasingly viable and abundant source of energy, particularly in Nova Scotia. Through the Municipality's Integrated Community Sustainability Plan (ICSP) Council has made a commitment to sustainability principles, in particular, the promotion of renewable energy development.

In seeking to provide opportunities for economic development, Council recognizes the benefits that large-scale wind development can have on individual property owners as well as the Municipality as a whole. By permitting large-scale wind development within the rural areas of the County, Council intends to strengthen the economic base of Kings County while also contributing to the Provincial renewable energy target. Large-scale wind turbines, also known as utility-scale wind turbines, are those turbines with a rated output capacity greater than 100 kW per year. These wind turbines can be developed in groupings or individually and are generally connected to the local transmission or distribution grid.

Council's aim is to provide opportunities for large-scale wind development where there is a known wind resource and where large-scale wind development is compatible with the surrounding land uses. The wind resource in Kings County is greatest in areas along the North and South Mountains. Therefore, Council will allow large-scale wind development in these rural areas of the County where the focus is on the protection and enhancement of natural resources and the encouragement of primary resource development. Council intends to encourage wind development in a way that limits safety, noise and visual impacts on neighbouring uses. This will be achieved by requiring minimum setbacks and separation distances between large-scale wind turbines and neighbouring dwellings.

5.5.1 Large-Scale Wind Turbine Objectives

- 5.5.1.1 To promote the development of large-scale wind turbines in an effort to reduce the Municipality's dependence on non-renewable energy.
- 5.5.1.2 To respond to the Provincial call for increased sources of renewable energy.
- 5.5.1.3 To minimize the potential negative impacts of large-scale wind turbines on neighbouring land uses and to ensure an acceptable standard of safety and compatibility.
- 5.5.1.4 To maintain consistency with and support the rural goals of the Strategy.

5.5.2 Large-Scale Wind Turbine Policy

- 5.5.2.1 Council shall provide for the siting of large-scale wind turbines within certain zones in the Agricultural (A), Forestry (F), Country Residential (CR), and Shoreland (S) Districts.
- 5.5.2.2 Notwithstanding Policy 5.5.2.1, Council shall not allow large scale wind turbine(s) within the Grand Pré and Area Plan boundary.
- 5.5.2.3 Council intends to regulate the placement and appearance of large-scale wind turbines to mitigate any potential negative impact they may have on surrounding uses. Therefore, the Land Use Bylaw will include the following provisions:
- a. minimum required setback from property lines, public rights-of-way and coastlines;
 - b. minimum required separation distance from dwellings on neighbouring properties;
 - c. other minimum requirements focussed on ensuring the safety of the development;
 - d. controls for signage and turbine appearance; and
 - e. requirement of an emergency response plan and a decommissioning plan.
- 5.5.2.4 Council shall include provision in the Land Use Bylaw to regulate the use of wind monitoring (meteorological) towers. These regulations shall include limits on the location of the towers and requirements for a development permit to ensure safety and mitigate conflict with neighbouring uses.

DRAFT LUB AMENDMENTS

1. Delete section 1.136 of the Land Use Bylaw and add the following in Part 1 Title and Definitions and renumber accordingly.
 - 1.157 **Wind Turbine** means a turbine that converts the wind's kinetic energy into either electrical power or mechanical energy. The turbine comprises the tower, rotor blades (either vertical or horizontal) and nacelle.
 - 1.157.1 **Blade Clearance** means the distance between the bottom tip of the rotor blade and the ground.

- 1.157.2 **Climbing Apparatus** means the ladder located on the turbine tower used for climbing and maintaining the turbine.
 - 1.157.3 **Decommissioning** means the final closing down of a wind generation development or project or the point at which an individual wind turbine or grouping of turbines have reached the end of their operational life and the process by which the site is restored to an agreed use or condition.
 - 1.157.4 **Kilowatt (kW)** means a measure of power for electrical current (1kW = 1,000 watts).
 - 1.157.5 **Large-scale Wind Turbine** means a wind turbine that has a rated output capacity greater than 100 kilowatts.
 - 1.157.6 **Nacelle** means the frame and housing at the top of the tower that encloses the gearbox and generator and protects them from the weather.
 - 1.157.7 **Rotor Blade** means the part of the wind turbine that rotates in the wind and extracts kinetic energy from the wind.
 - 1.157.8 **Small-scale Wind Turbine** means a wind turbine that has a maximum rated output capacity of no greater than 100 kilowatts.
 - 1.157.9 **Wind Monitoring (Meteorological) Tower** means a tower used for supporting wind monitoring equipment to assess the wind resource at a predetermined height above the ground.
 - 1.157.10 **Wind Turbine Height** means the height from grade to the highest vertical extension of a wind turbine which often occurs at the top of the arc of the rotor blade.
 - 1.157.11 **Wind Turbine Tower** means a freestanding structure or a structure attached to guy wires that serves to support other parts of the wind turbine.
- 2. Remove the following wording from section 3.2.16 k., “showing that the turbine is not within a 600 feet radius of neighbouring dwelling”.
 - 3. Add the following section in Section 10.1 of the Land Use Bylaw:
 - 10.1.6 **Siting of Large-Scale Wind Turbines**
 - 10.1.6.1 One or more Large-Scale Wind Turbines shall be permitted in an A1, F1, R6 or S1 Zone, except on properties within the Grand Pré and Area Plan boundary, subject to the following:
 - a. the blade clearance shall be a minimum of 25 feet.

- b. the minimum separation distance between wind turbines shall be equal to or exceed the height of the tallest turbine.
- c. the wind turbine shall be setback a minimum of one (1) times the turbine height from rear, front and side lot lines, public rights-of-way and coastlines.
- d. where a lot located immediately adjacent to and abutting a lot where a large-scale wind turbine is to be erected will be used for wind turbine development and the turbines on both properties will be connected to the same array, the setback requirement (contained in Section 10.1.6 c.) from the shared property line shall be reduced to zero.
- e. the wind turbine shall be located a minimum of 1968 feet (600 m) from any dwelling on a neighbouring property. This separation distance does not apply to a dwelling on the same property on which a large-scale wind turbine(s) is installed;
- f. notwithstanding 10.1.6.1 e. above, where a dwelling is constructed within the required separation distance of a large-scale wind turbine development, the wind turbine development may expand. The required separation distance for any expansion shall be equal to or greater than the separation distance between the initial wind turbine development and the dwelling.
- g. a development permit may be issued for one or more large-scale wind turbines to be located on a lot which does not front on a public street provided proof of access can be demonstrated.
- h. the wind turbine shall be finished in a non-reflective matte and in an unobtrusive colour;
- i. the only artificial lighting permitted on the wind turbine is lighting that is required by federal or provincial regulation;
- j. no signage shall be permitted on the wind turbine except that of the manufacturer's identification;
- k. The owner(s) of the land on which the wind turbines are located shall notify the Municipality of Kings County within one (1) year of wind turbine inactivity and shall remove the wind turbines and associated infrastructure within two (2) years of wind turbine inactivity.

10.1.6.2 Upon application for a development permit for a large-scale wind turbine, the developer shall submit the following documentation:

- a. the project definition including installed turbine(s) capacity, targeted long term production levels, scale elevations or photos of wind turbines showing total height, tower height, rotor diameter and colour;
- b. a site plan showing all buildings, roads, boundaries, natural features and alterations of site;
- c. wind turbine manufacturer's specifications and professional engineer's design and approval of turbine base(s);
- d. copies of all documentation required for *Canadian Environmental Assessment Act* and *Nova Scotia Environment Act* and regulations, if applicable;
- e. evidence of notification to and approval from Department of National Defence, Nav Canada, Transport Canada or other applicable agencies regarding potential radio, telecommunications and radar interference, if applicable;
- f. an emergency response plans for site safety;
- g. a decommissioning and reclamation plan; and
- h. any other information the Development Officer deems necessary to determine whether the development conforms to this Bylaw.

4. Add the following section in Section 10.1 of the Land Use Bylaw:

10.1.7 **Siting of Wind Monitoring (Meteorological) Tower**

10.1.7.1 One or more Wind Monitoring (Meteorological) Towers shall be permitted **in M2, M3, M4, M5, M6, M7, A1, F1, S1, S2, CS, R6, R7, R8, O2 Zones subject to the following criteria:**

- a. **A minimum separation distance between towers shall be equal to or exceed the height of the tallest tower.**
- b. **The setback shall be, at minimum, equal to the tower's total height from rear, front and side lot lines, public parking lots and public rights-of-way.**
- c. For properties that abut an A1, F1, or O1 zone, the rear and side setback in common with the A1, F1, or O1 zone may be reduced by 50% if the wind monitoring tower is no closer than the total height of the tower from all structures on the neighbouring property.

- d. **Any climbing apparatus shall be a minimum of 10 feet above grade.**
- e. **The wind monitoring tower shall not be located within a radius measuring 300 feet or 3 times the overall height of the tower from a residential dwelling on a neighbouring property, whichever is greater.**
- f. **In addition to the application for a development permit, the following items are required:**
 - **Provide the manufacturer's information including: type of tower and total height;**
 - **Provide a site plan showing the location of the wind monitoring tower(s) in relation to lot lines, dwelling on property and distance from adjacent dwellings;**
 - **Submit any necessary authorisation documents from Transport Canada and NavCan;**
 - **Submit an Environmental Impact Assessment (only for sites located all or in part in an O2 Zone); and**
 - **Submit tower and base designs certified by an engineer licensed to practice in Nova Scotia, and applicable letters of undertaking.**
- i. **There shall be no signs or advertisements attached to or added to the tower(s).**

5. Add Large-scale Wind Turbines as permitted uses subject to conditions in the A1, F1, R6 and S1 zones.
6. Add Wind Monitoring (Meteorological) Towers as permitted uses subject to conditions in M2, M3, M4, M5, M6, M7, A1, F1, S1, S2, CS, R6, R7, R8 and O2 Zones.

PLANNING ADVISORY COMMITTEE
PUBLIC PARTICIPATION MEETING
Large-scale Wind Turbine Policies
(File F-3-153)

Meeting, Date and Time	The Planning Advisory Committee held a Public Participation Meeting on Thursday, January 20, 2011 at 7:00 p.m. in the Council Chambers, Municipal Complex, Kentville, NS.
Attending	In Attendance:
PAC Members	Vice Chair Councillor Mike Ennis – District 12 Councillor Dick Killam – District 3 Councillor Eric Smith – District 11 Merrill Ward – Citizen Member Richard Ackland – Citizen Member Peter Jackson – Citizen Member
Councillors	Councillor Wayne Atwater – District 5 Councillor Basil Hall – District 9
Regrets	Chairperson Deputy Warden Janet Newton – District 2 Warden Diana Brothers – District 6 Councillor Fred Whalen – District 4
Staff	Leanne Jennings – Planner Cindy Benedict – Recording Secretary
Public	25 Members
Welcome and Introductions	The Vice Chair, Councillor Mike Ennis, called the meeting to order and introduced the members of the Planning Advisory Committee, Staff, attending Councillors, MLA Jim Morton, Kentville Councillor Eric Bolland, and welcomed the members of the public to the meeting. The Vice Chair explained that the purpose of the meeting was to solicit public input on the proposed amendments to the Municipal Planning Strategy and Land Use Bylaw to permit large-scale wind turbines in rural areas of Kings County.
Presentation	Leanne Jennings presented a power point presentation on the draft amendments to the Municipal Planning Strategy and Land Use Bylaw to control the location of wind turbines in the rural areas of Kings County. Staff drafted large-scale wind turbine policies based on the input received at the public meetings held on June 23 and 24, 2010. PAC reviewed the draft amendments on December 14, 2010 and forwarded them on to another PPM.

Following Ms. Jennings' presentation, the floor was opened for comments from the public.

**Comments
from the Public**

Dr. Gerald Klassen – 137 Newcombe Branch Road

- Retired physician with a background in science and a Board member with Annapolis Valley Health.
- Provided Recording Secretary with attached article “Turbines and turbulence”.
- Referenced upcoming Eagle Watch in Sheffield Mills and commented on problems in Denmark with its large number of wind turbines and eagles.
- Suggested that Kings County avoid putting up large-scale wind turbines in areas where our eagles congregate.
- The aesthetics of our area concern all citizens especially as this is a very beautiful part of the world. Windmills are not exactly pretty but if they serve a utilitarian purpose they can have a special role to play.
- The whole health of the region is another concern. We have a very unique type of geography with air inversions between the North and South Mountains.
- Dr. R. Gould, Health Officer for the region, has done a lot of interesting work with the Department of Environment on what is the consequence of pollution and how it affects our health. How pollution is altered by wind turbines could become a consideration when considering the benefits or harms with the proposal.
- Stirring up the air during low temperatures can be beneficial for apple trees but it is not a controlled variable. Nature has produced plants that depend on wind pollinators (nut orchard).
- One of the critical elements in maintaining and understanding new technology is research. We should be in the forefront making measurements to try and determine whether the proposed large-scale wind turbines are beneficial or harmful and where the indicator between the two is moving.
- Suggested having some sort of a fund generation to support the types of questions which might come up having these windmills within the region.
- Windmills in this region are not new but it is not well studied.

Andrew Manthorne – 24 Sunken Lake Crossroad

- Is an owner of a wind turbine and sells both large and small wind turbines.
- Offered to speak to anyone interested on government programs being put in place.
- Has no issues with the proposed policies as per say. Has an issue with the section that says that this is to deal with government incentives to meet the provincial government's requirements for greener energy.
- In 2011 Nova Scotia will be introducing a feed-in tariff system primarily designed to help communities and build wealth within communities

through alternative energy sources. This will be open to community development funds and native band counsels, non-profit organizations, farmers, co-ops, etc. Need to put us at the forefront; divide this up. The County's current small-scale wind turbine policies are obsolete due to the November-December change in the Nova Scotia Electrical Act. Nova Scotia Power has the ability to dictate how large of a turbine you can put on their net metering program. Suggest that you divide it up. Make the small scale wind turbine 0-50 kw and make a farm scale or a light industrial wind turbine 50-250 kw. A turbine with 250 kw costs about one million dollars. Need to have something to address this and make sure that we are getting the best bank for our buck as a community out of the Nova Scotia Government or everybody else is going to get ahead of us. The current proposals will see us paying 25%-50% more (1 ¼ to 1 ½ million).

LeRoy Little – 1155 Grand Pré Road, Wallbrook

- There is no requirement as to the amount of land required per turbine. This needs to be built into the zoning requirements to mitigate the impact on the surrounding area.
- The proposed turbines may be good for the farm but on a large scale the turbines are getting humongous. *The Ontario Farmer* states that land based towers are now commonly between 80 to 100 metres in height (20-30 storey building) while the turbine capacities are from 1 ½ to 2 megawatts.
- There are health concerns surrounding the glare of sunlight from the turbine blades and the generated noise level on humans that need to be taken into consideration.
- In the United States it has been found that bats are subjected to death due to the frequencies transmitted by turbines. Bats are the greatest way of getting rid of mosquitoes.
- The document needs to be expanded upon and studied more. This is too big a problem and no one has investigated it because it is seen as being "the green thing to do".

Paul Gervason – West Halls Harbour Road, North Mountain

- Economist, agrologist, landowner, farmer, woodlot owner and operator, curmudgeon.
- It is worthwhile to visit areas where there are wind turbines.
- During trips to south western Ontario has taken cognisance of the growth in the proliferation of large wind turbines.
- Wind turbines are being put up in areas close to country dirt roads keeping away from homes.
- The regulations require 25 acres to site a wind turbine. The landowners are buying lands next to them thus dissecting agricultural land in order to meet a regulation restriction on how many acres are needed to locate the turbines. This is not constructive in terms of the kind of land use planning that has gone on in this County with great care for many years.
- Would hate to see the wind turbines come in and cause a further

dissection of the landholdings in our County.

- We are so far behind the developments going on in the rest of the world.
- There is a lot of land on the North Mountain with prevailing northwest winds that slope up from the Bay that would be suitable to locate large-scale wind turbines (strips of land running north south).

Major Al Harvey – 14 Wing Greenwood / Major Mike Levangie – 14 Wing Air Traffic Control Officer

- Very pleased to see that in Section 10.1.6.2 e you have included the requirement for evidence of notification to and approval from DND, Nav Canada, Transport Canada or other applicable agencies regarding potential radio, telecommunications and radar interference from proposed wind turbines.
- The Base's main air traffic surveillance control radar (familarly known as the "golf ball") is located on the North Mountain.
- It is becoming a worldwide major problem for all air traffic control radars dealing with significant interference from nearby wind turbines. For 14 Wing Greenwood, there would be problems with seeing radar air traffic inbound traffic to Greenwood and outbound traffic from Greenwood and the coordination between Halifax traffic and Moncton traffic who is the main Nav Canada control of our air traffic in this area.
- There have been several representations to the Wing in accordance with these types of policies advising us of potential wind farm situations. We have met with the wind farm developers on several occasions and expressed our concerns and issues to them and have formerly objected to the installation of several large-scale wind farms in the Province. There is an organization in Trenton Ontario called ATESS (Aerospace and Telecommunications Engineering Support Squadron) who have the ability to technically analyze the impact based on height and location of the wind turbine themselves on our radar facilities.
- The primary aircraft control area that we support in the Greenwood area is a 25 nautical mile range from around the Base. We will object to all large-scale wind turbines being installed inside the 25 mile range. The objection will force the analysis process to occur and then we can look at mitigation measures and see what we can do, if anything, to accommodate. The bottom line, however, is if prevents us from carrying out our task in all weather, day and night, 365 24/7, DND will object to try and protect our ability to use our radar to control air traffic within 25 nautical miles of the Base and in some quadrants beyond that, depending on where the traffic is coming from. In other quadrants it won't be as much of a problem.

Mary Lou Harley – Port Williams (presentation attached)

- Retired from a consulting company and university teaching, some consulting experience related to land use planning and energy issues.
- Supports wind energy if done right and scale is an important factor.

- As the scale of the development increases an individual size of the turbine or number of turbines, or both, the potential for impacts increase.
- As a minimum these potential impacts require the following issues are addressed: the process that incorporates meaningful community consultation with respect to individual projects, noise issues including sound pressure and amplitude amplification through modulation and vibrational responses, shadow flicker, environmental impacts, recommendations with respect to tower light, tower height, design and local visibility conditions and structural safety issues, site specification factors and post developmental enforcement.
- These factors are not adequately addressed in the proposed amendments.
- From the background reports had thought this would be site specific regulations not as-of-right.
- Have not supplied full detail giving the research with references to support what I am saying but I can supply those.
- Cautioned against the approach to set the standard according to the amendments as presented until each of the issues has been addressed.
- Supporting the Provincial Government's agenda and the wind industry will do no good if poor planning leads to loss of public support or damage to community health and the environment.
- The World Health Organization has recognized that wind turbines have noise and vision burdens.
- The National Research Council states that wind energy projects create negative impacts on human health and well being, mainly on those living near the turbine affected by noise and shadow flicker.
- Setbacks and noise guidelines for wind turbines need to adhere to the authoritative limits such as guidance from the World Health Organization and established noise standards for environmental noise pollution.

In response to the question as to the radius the 25 nautical mile range would encompass, Major Harvey stated that it would be near the community of Gaspereau.

Adjournment

There being no further comments from the public, the Vice Chair adjourned the meeting at 8:00 p.m.

Approved by

Councillor Mike Ennis
PAC Vice Chair

Cindy L. Benedict
Recording Secretary

Leanne Jennings

From: Richard Deacon [rdeacon@invenenergycanada.com]
Sent: Thursday, January 13, 2011 3:26 PM
To: Leanne Jennings
Subject: RE: update on Kings County large-scale wind turbine policy

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Leanne,

On first blush this looks good. In the event the report is “draft” rather than “final” I have the following initial comments:

5.5 2nd para: references large scale turbines that produce more than 100kw – I think you mean that have a rated output capacity of or greater than (choose one) 100 kilowatts or 1 megawatt. Also, the reference to the distribution grid is a bit ambiguous. Typically if a wind farm has a total output capacity of 10MW or greater it will connect to transmission lines (69,000 volts or greater), less than 10MW and it will connect to distribution lines (less than 69,000 volts).

5.5.2.2.a) given South Mtn’s numerous and extensive watercourses, and the benign effect of wind turbines on watercourses except during the construction cycle (which construction impact can be limited and mitigated), I would suggest that turbine setback distances from watercourses be minimal (say 30m) in order not to sterilize large areas of South Mtn from wind development.

10.1.6.2.c) typo where “an” should be “and”

I can not attend on Jan 20 but thank you for the heads up.

Regards,

Richard Deacon
Invenenergy Canada
12 King Street West
Bolton ON L7E 1C7
tel: (905)479-2600
tel: (519)365-4180

From: Leanne Jennings [mailto:ljennings@county.kings.ns.ca]
Sent: Thursday, January 13, 2011 1:45 PM
To: rdeacon@invenenergycanada.com
Subject: update on Kings County large-scale wind turbine policy

Hello Richard,

I am writing to update you on Kings County’s progress in developing large-scale wind turbine policies. The Planning Advisory Committee heard general input from the public in June, 2010 and reviewed draft policies in December, 2010. The Planning Advisory Committee is now taking these draft amendments to the public for input before forwarding a recommendation to Council. This meeting is being held on **Thursday, January 20th, 2011 at 7pm** in the Municipal Council Chambers in Kentville. You are welcome to attend this meeting and/or forward any questions or comments to me directly.

Please find attached a copy of the Public Participation Meeting report for your information.

Regards,
Leanne

Leanne Jennings

Planner

Municipality of the County of Kings

PO Box 100, 87 Cornwallis St.

Kentville, NS B4N 3W3

Tel: (902) 690-6150

Fax: (902) 679-0911

Leanne Jennings

From: Derek Gee [derek.gee@hotmail.com]
Sent: Monday, January 17, 2011 9:21 AM
To: Leanne Jennings
Subject: Wind Turbines

Follow Up Flag: Follow up
Flag Status: Flagged

You have my vote on the installation of wind turbines in Kings Co., WITHOUT EMERA(NSP) involvement, we could build, maintain and produce power and not be on the hook for big bonuses to Corporations or their executives for doing the job they have been hired to fulfil.

If I get my neighbours permission, you can put as many turbines as will fit onto my property, again, WITHOUT ANY NSP(Nova Scotia Power) involvement, other than to remove NSP powerlines from my home, We could build and substain these wind turbines for less than the current liability we seem to have to NSP for any improvements or reinvestments, and maybe we would re-invest our profits into more of these without gouging the public as NSP continues to do.

Sincerely

Derek Gee
249 Exhibition Street
Kentville, NS
B4N 1C6

Submission to: Planning Advisory Committee, Municipality of Kings
Subject: Large-scale Wind Turbine Policies (File F-3-153)
Submitted by: Mary Lou Harley, PhD
43 Blomidon View Drive, Port Williams
Date: January 27, 2011

This submission follows from my oral presentation to PAC at the Public Participation meeting on January 20, and is submitted within the timeframe specified in telephone communication with Leanne Jennings, Planner.

I am retired from my consulting business and university teaching. My doctorate is in Chemistry and I have published in both chemical and biological peer reviewed journals. My consulting has been mainly in environmental impact assessment, product formulation, and development and application of environmental-socioeconomic strategies. Particularly relevant to this issue being considered by PAC, I have consulting experience related to land use planning and to energy issues.

I support wind energy, however, it has to be done right. As the scale of the development increases, in individual size of the turbine or numbers of turbines or both, the potential for impacts increases. As a minimum, these potential impacts require that the following issues be addressed:

- process that incorporates meaningful community consultation in site-specific projects
- noise, including sound pressure in the low frequency range and amplitude modulation
- shadow flicker
- the additional hazards to wildlife and the environment
- structural safety, blade glint, and ice-throw
- electromagnetic energy and interference
- site-specific factors related to siting, construction, and operation
- compatibility with agricultural, residential, and other existing land uses
- post-development accountability and enforcement

I realize that the County wants to support the agenda of the provincial government and promotion of wind power, however, it will be doing neither any good if poor planning leads to loss of public support.

OPTIONS FOR REGULATION

I strongly caution against the Set Standards (as-of-right) approach being proposed for all wind turbines over 100 kW.

In the Wind Power Background Information prepared by staff, three options for regulation are listed that would open the County to large-scale wind turbine developments: Set Standards; Site-Specific Approval; or a Blend of Set Standards and Site-Specific Approval. I am told by the Planner that the proposed amendments are attempting to Set Standards (as-of-right). According to the Background Information, this set of amendments is intended to establish pre-zoning for wind development so that for site-specific developments, there would be no review by Council and no public input, and no potential for appeal of the decision to the Utility and Review Board.

This Set Standards approach is not suited to address regulation of such a wide range of wind turbine sizes and it fails to acknowledge the site-specific factors. Consequently, the proposed regulations do not address the wide range of variable requirements within a given regulation that

are necessary to adequately regulate the multitude of wind development options that would have to be covered in both size of turbines and number of turbines.

Further the Set Standards (as-of-right) approach fails to provide for meaningful community participation. The Jacques Whitford NS report¹ pointed out the necessity for continued community involvement and again in their NB report² it is stated:

It is recommended that proactive community consultation occur, among residents, staff and council, prior to the adoption of specific by-laws by a local government to establish effective and locally appropriate approaches to the regulation of wind development. Further, this consultative and participatory approach should be extended to specific developments, sites, and opportunities that may be proposed for the community.

I ask the PAC to consider other policy options.

Please review the options suggested in section 4. of the Jacques Whitford NS report, in particular 4.1.1. which offers more policy options. Also, I bring to your attention Vermont Legislative Bill H-677 (read first time and presently at Committee level) that has placed wind turbines greater than 0.49 MW into this separate Bill. PAC may want to consider separate policies at this time for wind turbines greater than 100 kW and less than 0.5 MW, and further evaluate policy options for the larger wind turbines.

HEALTH IMPACTS

I urge the planning staff and PAC to acknowledge the World Health Organization's position on health impacts of noise, to adopt the WHO guidelines on noise and to reflect these guidelines in discussions with citizens and in amendments to the MPS and the LUB relating to wind turbines.

The Background Information and the presentation as given at the PAC meeting on Jan. 20, 2011, glossed over the potential human health impacts that regulations need to address. Openness in discussion with the public is necessary for informed decisions and trust, and appropriate application of precaution in the policies is essential.

World Health Organization has recognized that wind turbines have noise and visual burdens.³ The recent review⁴ of literature on health concerns associated with wind turbines by the Chief Medical Officer of Health for Ontario restricted consideration to *direct* health impacts. The World Health Organization recognizes noise as an environmental health hazard that also can have adverse health effects that are *indirect* in character such as sleep deprivation, annoyance, and stress. The National Research Council states:

... wind-energy projects create negative impacts on human health and well-being, the impacts are experienced mainly by people living near wind turbines who are affected by noise and shadow flicker.⁵

It is a defensible decision to develop the municipal setbacks and noise guidelines for wind turbines to adhere to the established guidelines of the WHO. The diversity of sound pressure

¹ Jacques Whitford Consultants. Jan. 24 2008. Project 1031581: *Model Wind Turbine By-laws and Best Practices for Nova Scotia Municipalities.*

² Jacques Whitford Consultants. Nov. 25 2008. Project 1036029: *Model Wind Turbine Provisions and Best Practices for New Brunswick Municipalities.*

³ World Health Organization. 2004. *Energy Sustainable Development And Health.*

⁴ King, Arlene (Chief Medical Officer of Health, Ontario). 2010. *The Potential Health Impacts of Wind Turbines.*

⁵ National Research Council (NRC). 2007. *Environmental Impacts of Wind-Energy Projects.* Washington, DC

limits and separation distances in regulator documents in various jurisdictions, the recent move to greater separation distances for industrial turbines, the gaps in the research, and the controversy around indirect health impacts heighten the need for an authoritative source upon which specifics in regulations can be based.

The WHO has established guidelines for community noise⁶ and recently complemented that work with night noise guidelines.⁷ In these documents, WHO recommends that for sounds that contain a strong low frequency component and amplitude modulation, which is typical of wind turbines, the limits be lowered and that the criteria use dBC frequency weighting instead of dBA.

Noise Protection in the Proposed Amendments

I find it unreasonable that in the proposed amendments to the MPS and LUB, noise protection is to be addressed just by set backs,

- intended to apply to all sizes, numbers, and configurations of large-scale wind turbines, and
- to be set so that the separations offer adequate noise protection regardless of terrain, atmospheric conditions, vegetation and other factors, and regardless of size or number of wind turbines.

There is no stated basis upon which to defend the set back requirements and the level of uncertainty means that a significant measure of excess protection must be included for this approach.

The purpose is protection from sound pressure, therefore

- **sound pressure exposure limits for dwellings that reflect WHO guidelines should be stated**
- **sound pressure exposure limits that reflect WHO guidelines should be stated for property lines to acknowledge and address the right of enjoyment of one's property**
- **set backs from property lines and dwellings should reflect distances applicable to the type of proposed instillation, with higher sound pressure level developments requiring greater setback**
- **a measure of excess protection must be included to address variables in terrains, wind speed, buffering conditions, etc.**
- **set backs from a dwelling should apply regardless of whether it is that of a participant or a non-participant; both should have protection**
- **flexibility should be included to allow additional restrictions as required for habitat of populations of wildlife, such as protection of species at risk, and protection of areas of population concentrations, like primary feeding areas, mating areas, nursery areas, and deer yards.**

Regulations that set actual sound pressure limits give a measure of health security to the approximated set-back, provide the target data for project modeling, set a basis for verification of compliance, and facilitate recourse when noise is cited in health complaints.

⁶ World Health Organization. 1999. *Guidelines for Community Noise*

⁷ World Health Organization, Regional Office for Europe. 2009. *Night Noise Guidelines for Europe*. Geneva, Switzerland

Shadow Flicker

The proposed amendments need to address shadow flicker.

Wind turbine shadow flicker has the potential to induce photosensitive epilepsy seizures however the risk is low with large modern models and if proper planning is followed. However, seizure is the extreme of the range of physical distress causes by the light pulse. Planning should ensure the flash frequency for large blades does not exceed three per second, and the shadows cast by one turbine on another should not have a cumulative flash rate exceeding three per second.⁸

Shadow flicker can be an issue both indoors and outdoors when the sun is low in the sky. To mitigate risk to human health wind turbines should be sited to ensure people will not be adversely affected; in our location people located East-NE or WNW from the turbine must be protected from shadow flicker.⁹

Recommended shadow flicker setbacks for current wind turbine designs are 10 rotational diameters. Greater setback distances may be required when wind turbines are sited on elevated ridges as the shadows can be cast over longer distances.

Planners should consult regulation recommendations on limits to total hours of shadow flicker in a year, commonly set at 30 hours/year.

Singular sensory effects, and combination of visual and noise impacts can lead to stress-related symptoms due to prolonged physiological arousal and hindrance to psycho-physiological restoration, including sleep deprivation.

ENVIRONMENT

The proposed amendments need to require local studies and environmental mitigation plans; such studies also feed into the noise impact setback flexibility for wildlife habitat and compatibility with agriculture.

Impact on birds, bats, and other wild life is well documented and recommendations for mitigations have been issued from several sources, such as the USA Fish and Wildlife Service.

Recommendations for reducing impact on wildlife must be part of site selection, site configuration and structure design regulations

Lighting

I acknowledge the lighting issue is addressed in the amendments.

Tower height

There is insufficient research on wind turbines, however, experience with communication

⁸ Graham Harding, Wind Turbines, Flicker, And Photosensitive Epilepsy: Characterizing The Flashing That May Precipitate Seizures And Optimizing Guidelines To Prevent Them, 2008

⁹ Verkuijlen E, Westra CA. (1984) Shadow hindrance by wind turbines. Proceedings of the European wind Energy Conference. October 1984, Hamburg, Germany.

towers clearly demonstrates that taller towers experience higher rates of mortality. The results of a long term (29 year) study showed that **towers should be less than 300 feet high** to reduce the threats to migrating birds.

Turbine Design:

According to the American Bird Conservancy, **guy wires and lattice towers**, which encourage perching and nesting, are associated with higher rates of bird mortality and **should be prohibited**. U.S. Fish and Wildlife Service **recommends tubular towers with pointed tops with no exterior ladders or platforms**. They both recommend that **power lines be installed underground**.

Low Visibility Conditions

Highest tower mortality rates are associated with low visibility conditions, especially fog and poor weather conditions.¹⁰ **Regulations should require that Turbines be shut down when such conditions occur during spring and fall songbird and bat migrations**

STRUCTURAL SAFETY

In recognition of blade and other fragmentation projectiles associated with structure collapse, **recommended setbacks for structural failure should be greater than turbine height**, as presently proposed in the amendments.

ELECTROMAGNETIC RADIATION AND ELECTROMAGNETIC INTERFERENCE.

The proposed amendments need to address directly electromagnetic interference (EMI) and mitigation.

The proposed amendments do not address electromagnetic radiation, other than to indicate approvals may be needed from another regulatory regime, thereby aspects of EMI, such as radar, may be addressed by those regulatory regimes.

There are very powerful electromagnetic fields around power cables and generators in a wind turbine. One of the common concerns associated with wind farms at the planning stage is EMI. Inappropriately designed wind farms can potentially cause interference to public services such as television and radio, or to private networks such as fixed links.

Final Comment

The size of individual wind turbines, the number, and their placement are important factors that need site-specific study as well as general guidelines. Minimizing setbacks to maximize the land base available to wind power development has to be balanced by reduced sound power level of the wind turbines. Reported preference in the questionnaire of the least setback may relate to support for family-sized wind turbines and community-based wind power utilization with feed-in to grid and preference for wind turbines to be on the lower-size side of large-scale turbines.

¹⁰ Canadian Wildlife Service. 2005. *Wind Turbines and Birds A Background Review for Environmental Assessment*.

Leanne Jennings

From: Don Hayden [gramphayden@hotmail.com]
Sent: Monday, January 17, 2011 9:57 AM
To: Leanne Jennings
Subject: RE: Info as to large-scale wind turbines

Follow Up Flag: Follow up
Flag Status: Flagged

To whom it may concern:

Good Morning good people of Kings County Council,

A friend emailed me this morning about an article in the Halifax Chronicle Herald concerning a public meeting to be held in your Council Chambers on Thurs. Jan. 20th, as to input of info concerning knowledge and experience of large-scale wind turbines.

As some of you may be aware, Digby Neck now has 20 such wind turbines up and running, all too close to human habitation.

I pray God, you folks are council members who seriously consider the HEALTH and quality of living of your taxpayers. Our Municipal Council issued permits long before they were even aware of what these monstrosities involved, simply because they were looking ahead at tax dollars.

These things should ABSOLUTELY NOT be permitted to be located any closer to any habitable dwelling, permanent living, OR Seasonal, any Church, Hermitage, Hospital, Daycare facility, or workplace, than 2450 m. I would like to refer you to www.windturbinesyndrome.com

and review the works of Dr. Nina Pierpont of New York, and her knowledge of such structures, where she states that this infrasound can cause Leukemia in children, other cancers, worsen Epilepsy, Vertigo, Tinnititus, and oh, so many other health problems.

On Digby Neck, some are as close as 600m to homes, causing Migraine headaches, Neuralgia, and all sorts of ailments, which Wind Turbine Proponents refuse to associate with the infiltration of infrasound vibrations through the bedrock and soils underground, and coming up through the foundations of the homes.

The outside noise is unbearable, and as one neighbour says, his carport seems to act as a funnel which the noise comes through, and enhances the noise at his back door, causing him to think he may have to dismantle it to try and diminish the noise, (which, I highly doubt, would be of any help).

We have also found, that with knowledge of wind turbines in the area, our homes are ABSOLUTELY impossible to sell and try to move away. Therefore, you could say, these wind turbine proponents have pronounced our death sentences.

I seriously implore you, as council members, to do some very serious research into this matter before drafting a final version of any land use bylaws concerning large (or small) wind turbines.

It is too late, after they are constructed and running to think twice about having permitted them to be too close to peoples living quarters .

Thank You for your time,
Evelyn Hayden
10471 Hwy 217, R.R.#4,
Rossway, Digby County,
Nova Scotia
B0V 1A0
gramphayden@hotmail.com
(902) 245-2636

Leanne Jennings

From: D lacey [davidlaceygallery@hotmail.com]
Sent: Friday, January 14, 2011 11:44 AM
To: Leanne Jennings
Subject: RE: update on Kings County large-scale wind turbine policies

Hi Leanne

I have reviewed the info on the LSWT process for the County and am in favour of the document as it stands with one small caveat. I did not notice that there was a provision for landowners within the proposed permitted scope of the LSWT's to allow in writing or by contractual agreement for the LSWT's to be constructed if they wished below the prescribed distance from their dwellings. I do think such a provision should be included (maybe it was but I couldn't find it) in the final document. This would allow for consenting homeowners, whether for compensation or not, to allow for such construction and operation if they desired.

Other than that small but important facet I feel this document is quite well crafted and seems to cover all the bases. Now lets move forward and get this cast in stone. Congratulations on a job in the process of being well done! You remain a shining light and the Municipality is very fortunate to have you on board.

Thank you

David

David Lacey
4092 Rte 359
Centreville RR3
Kings County
Nova Scotia
Canada
B0P 1J0

902-678-3003

www.davidlaceygallery.com
davidlaceygallery@hotmail.com

Winter:

257 South Oak St
Port St Joe , Fl
32456

850-227-1248

Quote: **Why do people who know the least know it the loudest?**

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Subject: update on Kings County large-scale wind turbine policies
Date: Thu, 13 Jan 2011 15:16:05 -0400

From: ljennings@county.kings.ns.ca

To: davidlaceygallery@hotmail.com

Hello Mr. Lacey,

I am writing to update you on Kings County's progress in developing large-scale wind turbine policies. The Planning Advisory Committee heard general input from the public in June, 2010 and reviewed draft policies in December, 2010. The Planning Advisory Committee is now taking these draft amendments to the public for input before forwarding a recommendation to Council. This meeting is being held on Thursday, January 20th, 2011 at 7pm in the Municipal Council Chambers in Kentville. You are welcome to attend this meeting and/or forward any questions or comments to me directly.

Please find attached a copy of the Public Participation Meeting report for your information.

Regards,
Leanne

Leanne Jennings

Planner

Municipality of the County of Kings

PO Box 100, 87 Cornwallis St.

Kentville, NS B4N 3W3

Tel: (902) 690-6150

Fax: (902) 679-0911

Leanne Jennings

From: Ross McLaren [MCLAREN@gov.ns.ca]
Sent: Thursday, January 13, 2011 3:17 PM
To: Leanne Jennings
Subject: Re: update on Kings County large-scale wind policies -question

Follow Up Flag: Follow up
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Thanks Leanne,

Just took a quick look through the document ... will give a longer read later. Looks like you did some yeoman work ... very comprehensive. Well done.

I had a question ... in Large-Scale Wind Turbine Objectives:

5.5.1.2 To respond to the Provincial call for increased sources of non-renewable energy.

Shouldn't it be "increased sources of renewable energy"?

Also, under 5.5, there is a sentence that reads: "These wind turbines can be developed in groupings of two or more turbines, called wind farms, and are generally connected to the local distribution grid." I would add generally connected to the local distribution and transmission grid.

Bye for now,

Ross

Ross McLaren
Director, Special Projects
Renewable Energy
Nova Scotia Department of Energy
Tel: 902-424-4536
Cell: 902-456-4212
www.gov.ns.ca/energy

>>> "Leanne Jennings" <ljennings@county.kings.ns.ca> 1/13/2011 2:51 PM

>>> >>>

Hello Mr. McLaren,

I thought you might appreciate an update on Kings County's progress in developing large-scale wind turbine policies.

The Planning Advisory Committee heard general input from the public in June, 2010 and reviewed draft policies in December, 2010. The Planning Advisory Committee is now taking these draft amendments to the public for input before forwarding a recommendation to Council. This meeting is being held on Thursday, January 20th, 2011 at 7pm in the Municipal Council

Chambers in Kentville. You are welcome to attend this meeting and/or forward any questions or comments to me directly.

Please find attached a copy of the Public Participation Meeting report for your information.

Regards,

Leanne

Leanne Jennings

Planner

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Fax: (902) 679-0911

Leanne Jennings

From: Dan Mills [danmills@eastlink.ca]
Sent: Monday, January 17, 2011 9:09 AM
To: Leanne Jennings
Cc: dan mills
Subject: Information- Re.Turbines in Kings County
Attachments: Story from the thestar.com: Walkom: How McGuinty's windmill dreams became a nightmare

Follow Up Flag: Follow up
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Dear Sir/Madam:

The Wind Industry in Canada is in evolutionary process, and we are still at an embryonic stage for lack of information - knowledge, truth, and certitude.

There is the risk in Nova Scotia of forgetting that "Rome wasn't built in a day."

I hope others will pick up the gauntlet in areas where turbines now exist and offer their advice and experience. I have 5 facing my door and yet have not had time to adjust to the noise I hear, or to fully grasp the immensity of what the ultimate effects may be in this community on health, property values, and the like. We've just turned them on within the month.

I am attaching an item from the January 15th.edition of the Toronto Star. I believe it is turning a new page in Ontario's history about the future of Wind Turbines, and a more comprehensive look than we've had to now. Dr.McMurtry is alert and aware, and a leader in seeking truth about the effects in the long haul, on what may seem an easy fix to our energy crisis. All this is in the light of global warming and what it has already wrought on the planet, and whatever lies ahead. He does well in exacting a moratorium until a fill-fledged study is undertaken and completed.

I trust you are aware of the work of Dr.Nina Pierpont, a medical doctor in the State of New York, called "Wind Turbine Syndrome".....She is easily accessed on-line. I do hope and pray that each and every of your PAC members will hold a copy in hand as they proceed in their deliberations.

Sincerely yours,

Daniel Mills

Leanne Jennings

From: The Starritts [starritt@ns.sympatico.ca]
Sent: Tuesday, January 18, 2011 2:30 PM
To: Leanne Jennings
Subject: Large Scale Wind Turbine Policy

Hi Leanne,

This is just to provide written confirmation of our discussion this afternoon regarding the LSWT Policy for your records.

I have been working with a number of Wind and Solar Energy companies over the past few years in obtaining land leases for these projects, including some areas of Kings County. Although I am not currently working with any one in Kings County, and in fact I live in Halifax County, I would still like to make the following comment on your LSWT Policy document.

Section 10.1.6.1 j. of the document raises a concern for me from the landowners perspective. That is that the "owner" of the land, would be responsible for notification of inactivity and removal of any turbines that are inactive for two years. I believe that if this were part of the County's Siting Policy that it might deter many land owners from signing leases as they would be afraid that they might get stuck with an inactive turbine and the associated costs of removal. This would be a particular concern for any absentee land owners.

I understand that this issue has been discussed and it has been concluded that this issue should be addressed between the Land Owner and the Lessee/Proponent in their agreement..

Thanks for your help and good luck with all of your efforts.

Kind Regards
Cameron Starritt

Cameron Starritt
Independent Land Management Consultant
Home Office 902-864-4583 Cell 902-225-1717