


Regional Plan Advisory Committee – March 2, 2011
Environment & Sustainability Committee – March 3, 2011

TO: Chair and Members of the Regional Plan Advisory Committee
Chair and Members of the Environment and Sustainability Standing Committee

SUBMITTED BY: 
Paul Dunphy, Director of Community Development

DATE: February 2, 2011

SUBJECT: Project 00953: Wind Energy Facilities in HRM

ORIGIN

1. On November 21, 2006 Regional Council initiated a planning process to prepare policy and land use regulations for the location and siting of the wind turbines in HRM.
2. On January 23, 2007 an information report was tabled outlining the community consultation process for Phase 1 of the Wind Energy Project.
3. On October 24, 2007 motion was passed by the Regional Planning Advisory Committee to begin community consultation for Phase II of the Wind Energy Project.
4. On July 2, 2009 staff presented recommendations and proposed policy direction to Energy and Underground Services Committee. Committee members requested additional community consultation.
5. In July 15, 2009 presented staff recommendations to RPAC indicating an additional round of community consultation would be undertaken in the fall of 2009.
6. On September 29, 2009 at the Committee of the Whole staff was requested to undertake a final round of community consultation, which was completed in February 2010.

7. On August 18, 2010 at the Committee of the Whole staff presented the recommended policy direction and the time line to bring the project for decision. At the August 18, 2010 Council session, the following motion was approved: Moved by Councilor Smith, seconded by Councilor Sloane, "that the Halifax Regional Council direct staff to proceed to draft the Land use By-law for consideration of the siting of wind turbines in accordance with the direction outline in the presentation, including as-of-right development (within the designated zones as identified)." Motion Put and Passed.

RECOMMENDATION

It is recommended that the Regional Plan Advisory Committee and Environmental & Sustainability Committee recommend that Halifax Regional Council

1. Give First Reading and set a public hearing date to consider amendments to the Regional MPS and the Community LUBs to create policy and regulations (typical examples are set out in Attachments "A and B") for the purpose of regulating Wind turbines in the Halifax Regional Municipality.
2. Adopt the amendments to the Regional MPS and Community LUBs as provided in Attachments A and B respectively of this report.

EXECUTIVE SUMMARY

On November 21, 2006 Regional Council initiated a planning process for the purpose of creating policy and regulations for the siting of wind turbines in HRM, citing an increasing demand for wind power and the strategic direction of the Community Energy Functional plan. At that time the Province was undertaking its own initiatives for wind power, acknowledging the increased demand for alternative energy sources at the Provincial level.

Through extensive public consultation, the generalized findings of the community input were:

1. HRM should encourage and support wind energy
2. Adequate measures need to be enacted to minimize the impacts of wind turbines on surrounding residential land uses, and;
3. Mixed opinions as to whether wind turbines should proceed on an as- of- right basis or by discretionary approval (consideration by Council and a case by case basis)

Recommended Approval Procedure for Wind Turbines in HRM

Staff recommendations support processing Wind turbines on an as- of- right basis and to apply appropriate setbacks and distance separation criteria that work in tandem with the Provincial Environmental Assessment (EA) process for the siting wind turbines in Nova Scotia. The EA process applies to all wind project exceeding 2 megawatts of power.

URBAN HRM

Suitable Locations for Urban Wind Turbines

The new regulations seek to establish suitable sizes, locations, and setbacks regulations for Wind turbines in all areas of HRM. In the urban area it is recommended that a range of wind turbines (micro, small and medium) be permitted in select locations within the urban boundary (defined for this project to include the urban service boundary and designated areas identified in the Regional Plan for future residential growth). Wind turbines outside of the selected areas that included Business Parks and some select Marine Industrial waterfront locations would be prohibited. Large Wind turbines would also be prohibited in the Urban Core. Permitted locations for micro, small and medium size turbines include Business Parks and certain Marine Industrial. Waterfront locations, large scale wind turbines are not permitted within the Urban Area. In all areas of urban HRM (e.g. residential neighbourhoods), no turbines of any size are permitted. The following is a synopsis of the proposed recommendations for urban wind turbines:

- Business Parks
- Selected Marine Industrial Locations
- All other areas Restricted excluded

Maximum Heights and Power Ranges of URBAN AREA Wind Turbines (Business Parks and Marine Industrial Locations)

- Micro 23 metres (75 feet) and 10 kilowatts
- Small 35 metres (115 feet) and 50 kilowatts
- Medium 60 metres (197 feet) and 300 kilowatts
- *Large Wind turbines are not permitted*

Setbacks from Property Lines and Non Sensitive Land Uses (i.e. Commercial and Industrial Office) -- Micro, Small and Medium Wind Turbines:

- Property Lines -- *1.0 times the height of the Turbine*, and
- Adjacent Non Sensitive Buildings – *1.5 times the height of the Turbine*,

Setbacks from Wind Turbines to Adjacent Sensitive Buildings (i.e. Residences and hospitals etc)

- Micro -- *3.0 times the height of the Turbine and;*
- Small -- *180 metres (590 feet) from the Turbine*
- Medium -- *250 metres (820 feet) from the Turbine*

Large wind turbines are not permitted in the Urban area

RURAL HRM

Suitable Locations for Rural Wind Turbines

Unlike the Urban area, it is recommended that the full range of wind turbines categories be permitted. This includes micro, small, medium, and large scale turbines, including potential wind farms. Rural wind turbines would be permitted everywhere provided that:

1. Defined setbacks and separation distances can be met, and
2. Turbines are not permitted in any Restricted Zone.

The Restricted Zone is comprised of Conservation Areas, Protected Areas, the Western Commons, and Regional Parks. The following is a synopsis of the proposed recommendations for rural wind turbines:

Areas of Restriction – All Rural Wind Turbines

- Regional Parks
- Protected Areas
- Conservation Areas
- Western Commons

Maximum Heights and Power Ranges of Rural Wind Turbines

- Micro -- 23 metres (75 feet) and 10 kilowatts
- Small -- 35 metres (115 feet) and 50 kilowatts
- Medium -- 60 metres (197 feet) and 300 kilowatts
- Large -- 60 metres plus (197 feet +) and greater than 300 kilowatts

Setback Regulations

- a) From a micro wind turbine to:
 1. a property line – *2.0 times the height of the Turbine, and;*
 2. a habitable building on Adjacent Lot (residence, hospital, etc) – *3.0 times the height of the Turbine*
- b) From a small wind turbine to:
 1. a property line -- *2.0 times the height of the Turbine,*
 2. a habitable building on adjacent lot -- *180 metres (590 feet) from the Turbine*
- c) From a medium wind turbine to:
 1. a property line -- *1.5 times the height of the Turbine, and;*
 2. a habitable building on adjacent lot -- *250 metres (820 feet) from the Turbine.*
- d) From a large wind turbine to:
 1. a property line -- *1.5 times the height of the Turbine, and;*
 2. a habitable building on adjacent lot -- *550 metres (1805 feet) from the Turbine*

Waiver of Setback to Property lines for Wind Farms Utilizing More than One Property

It is also recommended that a waiver of the setback to property line requirement be included where large wind turbines on abutting property (s) that connect to the same array to form a wind farm. This recommendation is intended to remove artificial constraints where the property line setback does not form a specific function.

BACKGROUND

The profile of wind energy has become much more prominent in recent years both across the World and in North America. In Canada by 2003, total wind power generation was approximately 300 megawatts across the country. Today, wind energy power production is in excess of 4000 megawatts. Policy targets across Provincial jurisdictions further demonstrate an increase in the demand for renewable energy sources. These targets for renewable energy production (of which wind energy will form a major part) are slated to exceed 12,000 megawatts by 2015 if policy milestones can be reached. The aggressive growth rate of renewable energy and in particular wind energy in Canada is now beyond dispute in many regions in this country demonstrating significant acceptance of wind power. It is now commonly understood that the conversion of wind energy to electricity can reduce dependence on non renewable energy

sources and decrease the air and water pollution that results from the use of conventional energy sources.

Wind is clearly an abundant resource in Nova Scotia and consequently, the demand for wind energy is increasing here. Recently, the Provincial Government amended the Electricity Act (May 2010) which now requires that 25% of the total power production to the electrical grid must come from renewable sources (eg. wind, solar and tidal power) by the year 2015. This demand has spurred local economic interest in wind energy development throughout the Province and within HRM.

The Community Energy Functional Plan (CEFP), a subset of the Halifax Regional Municipal Planning Strategy (RMPS), had previously identified the need for the sustainable energy use with an emphasis on wind energy. However the translation from demand to land use regulation has been a challenging one. This is in part due to the nature of this land use as a highly prominent and visible moving fixture on the landscape that produces sound as part of its operation. It is also in part due to the conditions required to develop wind energy facilities that often must be within proximity to existing transmission infrastructure and accessible to the road network. This includes suitably sized power lines to transfer the production of power to the grid and often also within proximity to a receiving source such as settlement or urbanized area, which is in effect about proximity to its market.

Consequently, while wind energy is considered a valued and environmentally friendly power source, the siting of wind turbines, particularly within proximity to populated areas, raises planning concerns. In HRM, there is currently a lack of regulation in the existing zoning by-laws for Wind turbines. Consequently, to date wind turbines have been permitted by default rather than by intention. However, wind turbines require regulation to mitigate impacts to residents. The proposed policies and regulations are aimed at striking an acceptable balance for the siting of wind turbines in HRM, by enabling their development in suitable locations, utilizing straight forward approval processes, and providing adequate distance separation from adjacent residential uses.

DISCUSSION

Wind turbines range in height and scale and are often classified based upon the height of the machine and the amount of power that it is intended to produce. There appears to be no industry standard for height and range of Wind turbine category. Regulation of wind turbines through set backs and other criteria vary widely between contexts around the world and throughout various jurisdictions in Canada and Nova Scotia. The size and production output (or name plate capacity) of wind turbines are highly dependent upon the location where the machine(s) is located. Wind speeds and wind consistency are two of the most important factors in wind energy production.

Large Wind Turbines

Large scale wind turbines have been constructed in several locations in Nova Scotia. Wind farms are typically comprised of two or more large towers that interconnect to form an “array”. The power that is produced is then sold commercially to Nova Scotia Power Inc. (NSPI) by way of a formal interconnection agreement between the producer and the utility.

These wind turbines are generally set in rural locations on high points of land to take advantage of strong and consistent prevailing winds. There is much variation in how wind turbines are defined. In the case of large wind turbines, the height of the turbine can range from a minimum of 60 metres (197 feet) to well in excess of 120 meters (394 feet) (to the highest tip of the rotor blade). The power generated from these machines is generally expressed in megawatts (MW). As an instantaneous measure of power, one MW (or 1000 watts) can generate power sufficient to meet the power demand of approximately 300 to 400 single family homes. On the commercial side, a large format retail store might draw approximately one megawatt of power. However, there is difficulty in sustaining the power generation over time through storage.

Of note is that wind turbines producing 2 MW or more are required by the Province to undergo a Provincial Environmental Assessment (EA). Federal requirements may also apply.

Micro, Small and Medium Wind Turbines

In cases where the wind turbines are not connected to the electrical grid, the power would act as a supplemental power source for an existing facility such as a factory or manufacturing operation.

Micro, small and medium wind turbines can range from heights less than 3 meters (10 feet) to upwards of 60 meters (197 feet). Micro turbines can produce a little as 10 watts of power (enough to power a light bulb) while the medium turbines can produce in excess of a 100 kilowatts (enough to power approximately 25 households).

Medium wind turbines can generate enough power sufficient to act as a supplemental power source for commercial or industrial operations. These machines are currently in operation in HRM today. Micro and small wind turbines, in relation to the larger machines, produce relatively low levels of power production and are often suitable to act as supplement to a single residence or activity.

CURRENT REGULATORY REGIME FOR WIND TURBINE

The Provincial Role and Wind Energy

Outside of municipal land use regulations, the wind energy industry is subject to provincial legislation pertaining to electric power generation and distribution. Provincial de-regulation of the energy sector has enabled private energy suppliers to partner with NSPI to access the provincial power grid in order to utilize existing electrical transmission infrastructure. However, the nature of wind energy as an intermittent power source offers some technical challenges to the current energy infrastructure that limits the amount of useable power capacity to the power grid. In order to realize the development of a wind energy projects, wind energy proponents must be able to comply with three major regulatory aspects:

1. have an interconnection agreement with NSPI to sell power to the power grid;
2. comply with Environmental Assessment requirements; and,
3. comply with Municipal land use regulations

The Provincial Environmental Assessment and Large Wind Turbines

A Provincial Environmental Assessment (EA) applies when a wind turbine project is planned to generate 2 MW of power or more, which is typically only produced by large wind turbines. The amount of power that the wind turbine project will generate is linked to the location, number of towers, their heights and rotor sizes.

The EA process is a comprehensive and time consuming undertaking, typically involving numerous studies (environmental and social) in order to address a multitude of evaluation criteria as determined by the Province. One of the major controversy's regarding wind turbines is in establishing how far away from a residential dwelling wind turbines should be placed to account for sound and other impacts. When considering a suitable separation requirement for a large wind turbine development (such as a wind farm) it is understood that the Provincial EA works within municipal regulations, such that the EA process will never lessen the municipal distance separation requirement. It will either leave the distance requirement the same or it will increase it.

Of note is the fact that no EA process is required below the 2 megawatts level. Therefore all siting policies and regulations fell to the Municipality to develop and enforce.

Existing Municipal Regulation for Wind Energy

In this region, the development of wind-generated energy is newly emerging, and therefore was not anticipated at the time when the current municipal land use policies and regulations were adopted. Consequently existing municipal planning strategies and land use by-laws do not specifically provide regulations for wind turbines as a use of land. However, various land use by-laws have inclusive wording that permits wind turbines by default rather than by design. Other LUBs prohibit turbines, again, by default.

Wind turbines may not be appropriate locations in terms of compatibility with other sensitive land uses such as a residence or a hospital. Further, some areas, by virtue of exclusionary language in the by-law, may exclude a project where it may be appropriate to site it.

Other NS Municipalities

In general, regulations between municipalities vary widely in Nova Scotia. Some municipalities have opted for as-of-right approvals, while others use discretionary approvals to process wind turbines. Most municipalities do not address smaller scale wind turbines but rather focus their regulations on large wind turbines used for wind farm development. Within this sector there is also significant variation in terms of setback and separation regulations. For example, at the lower end of the spectrum Cape Breton Regional Municipality has adopted a 175 meter (575 feet) distance requirement from the turbine to a residence with an increase in distance of one meter for every additional meter in tower height. At the other end of the scale, Antigonish and

Richmond Counties appear to have the more stringent requirements for distance separation from large utility scale wind turbines that would be used for a wind farm, to residences, at a full 1000 metres (3281 feet).

Further afield, in other jurisdictions in Canada, North America and Europe, research has revealed that there is no industry standard respecting distance setback and separation regulations.

PUBLIC CONSULTATION

NOT IN MY BACK YARD (NIMBY) and Wind Turbines

Given that wind technology's principal function is to harvest the wind, the operation of wind turbines require that they be placed on high points of land to take full advantage of the wind resource. The higher the altitude, the greater the winds, which means that wind turbines are typically very prominent fixtures on the landscape. Even at lower altitudes, the use of smaller scale turbines, such as those in the micro and small categories create much debate about how these machines can suitably integrate into existing neighbourhoods and to what extent they should and can be screened from view. However unlike stationary cell towers and the older dish technology of the 80s and 90s, wind turbines rely upon kinetic energy to move the blades in order to produce power. Impacts from this movement (noise, vibration) have been reported particularly at the large wind turbine scale.

To reduce these potential impacts, wind farms are typically separated much farther away from habitable buildings. Given their visual prominence, key consideration in any wind turbine project ranges from where to site them in the wider geographical context and also how these facilities are arranged on a given site. Beyond its potential as a source of renewable energy, there is relatively little consensus regarding the impacts of Wind turbines to adjacent land uses save for the following:

1. Wind turbines are prominent features on the landscape,
2. The level of visual intrusion is subjective in nature,
3. Wind turbines at all scales generate sound which at times and in certain locations can produce impacts, the extent to which is also open to a subjective interpretation; and,
4. Many people do not want wind turbines near homes or within their views.

The protection of views is not only a contentious issue for residents but is also a concern to the municipality. As stated, the nature of wind turbine development is such that the machines are likely to be highly visible. Concern has been raised that such development could impact the views and enjoyment from some protected areas. For example, areas have been identified containing views along identified canoe routes such as Suzie's Lakes near Bayers Lake Business Park. This area has been highlighted as sensitive to potential development. The presence of wind turbines is considered a potential disruption to the natural setting preferred by enthusiasts that would utilize the canoe routes there. In completing an impact analysis on the Chebucto Peninsula to determine how this might impact the Suzie Lakes canoe course it is clear that wind turbine development in Bayer's lake could not sufficiently be screened to remove them from all views from the canoe routes given the proposed heights of the machines. In fact wind turbines in

excess of 60 metres (197 feet) and in some cases as high as 120 metres (394 feet) in height at many other locations on the Chebucto Peninsula could be visible structures from the many areas of the municipality. The same would be true for areas along the Eastern Shore and many other locations of HRM.

Fundamentally, this issue is at the very core of what accepting wind turbine technology on the landscape means. These machines cannot be well disguised. The wind resource is largely along the coast, likely within some proximity to smaller settlements and often within site of natural features. Accordingly, Council's decision may rest simply on whether to permit the structures or not. Given the analysis that we have undertaken, staff is recommending that no wind turbines of any size be permitted within any Regional Park, Protected Area, Conservation Area or the Western Commons (Restricted Zone). However for areas that fall within the viewshed of these restricted zones, staff is recommending that turbine development be permitted according to the regulations described in this report.

Community Consultation

Community Consultation was undertaken at two separate occasions, first over a course of five months from January to May of 2007 and secondly, from November of 2009 to April of 2010. In total, some 21 meetings were held in rural and urban locations throughout HRM. Meetings were also held with the Bayers Lake and Burnside Business Park Associations as well as meeting with the Department of Energy and Nova Scotia Power. Staff also heard from the wind energy development community.

Common concerns and values were expressed consistently over the course of the consultation meetings. The public wants and supports the use and benefit of wind energy but does not want the impacts from wind energy. That information has also been consistent with the results of a recent study which was completed by Jacques Whitford in 2009, *Public Attitudes of Wind turbines in the Maritimes*. It is clear that public sentiment is split on whether wind turbines are a blight or a sculpture on the landscape. In particular the following concerns were raised:

1. Concern for adverse effects, both health and nuisance;
2. Concern over property values and views;
3. Request for increase proposed separation distance for large Wind turbines;
4. Provide greater accessibility to smaller scale Wind turbines for home use; and
5. Provide public consultation and input into wind farm projects

Community concern over adverse effects is often cited in the larger debate concerning the siting of Wind turbines. It can be stated that difficulty in how to integrate Wind turbines into the environment in a manner that is satisfactory to all parties is a universal problem to the larger industry. Concern for property values and the potential obstructions to views is a continual theme even if there is little empirical evidence to suggest that human health or property values are negatively affected by Wind turbines. As the demand for renewable sources of energy increases, greater accessibility at all scales of development, whether it be at the dwelling unit level or at larger commercial scales of operation, appears to be gaining momentum.

Again through research and analysis, staff had strived to achieve a satisfactory compromise between these competing interests through the encouragement of wind turbine development in suitable areas by adequate separation distance to minimize their impact on surrounding uses.

RECOMMENDATIONS FOR WIND TURBINES

Synopsis of Proposed Amendments

The following are staff's proposed amendments to the RMPS and Community LUBs as shown in Attachments A thru C. To reduce the length and amount of repetition, amendments to all of the specific Land Use By-laws will be included in a supplementary report to Regional Council. The attached amendments to Regional Municipal Planning Strategy and the Community Land Use By-laws which were summarized as follows:

- (1) *Amendments to the Regional Municipal Planning Strategy and Community Land Use By-laws:*

The amendments proposed to the Regional Municipal Planning Strategy and Community Land Use By-laws focus on:

Regional Municipal Planning Strategy:

- (a) creating preamble and policies to enable wind energy facility siting

Community Land Use By-laws:

- (b) adding definitions;
- (c) adding a new section with a comprehensive set of requirements;
- (d) inserting siting standards (i.e. Wind turbine total height, yard setback regulations, signage)
- (e) clarifying separation requirements; and,
- (f) include mapping indicating location suitability

However, amending all Community LUBs in the manner described above entails significant repetition resulting in a lengthy amendment package. In order to minimize the overall bulk of this report, the amendments will be included as part of an amendment document package (ie, this document contains the preamble wording, policies, definitions, siting requirements and standards to be included in all of the Community LUBs) to Regional Council. The planning documents for remaining Plan areas contained in this package will outline all of the amendments along with any new wording that is specific to the particular Community LUB.

Explanation of Proposed Amendments

Policy Direction

The following recommendations seek to balance the safety and security of residents while promoting wind energy as a viable source of renewable power as outlined in the community energy functional plan. Based on this mandate the proposed policy direction is comprised for three essential factors:

1. That wind turbines be developed through an as-of-right approval/ permitting procedure in all areas of HRM;
2. That Wind turbines should be treated differently between urban and rural HRM; and,
3. Suitable distance separation and setbacks will mitigate impacts to residents.

Permitting Wind Turbines As-of-Right

The use of discretionary approvals such as development agreements, re-zonings or site plan approvals are not recommended to process wind turbine applications. These processes are effective tools to optimize site function, locate physical features such as landscaping or in addressing lighting concerns. Building massing and scale, and operational aspects such as establishing suitable hours of operation can also be effectively managed through these kinds of development application.

Even if a discretionary approval were to be employed for wind turbines, it could not be used as a plebiscite to determine if a wind turbine would be permitted in a given location. That decision is made at the time of the approval of RMPS policies. If a discretionary approval were to be used in such a fashion the decision to refuse the turbine on that basis could be overturned on appeal. Accordingly, the concern in introducing discretionary approvals is that providing that option could also provide a false expectation to the public. There could be concern that a proposed location of the wind turbine could be reason enough in Council's decision to refuse the application. It is commonly understood that there is a significant portion of the public that are predisposed towards refusal of wind turbines in general. The use of discretionary approvals could provide the false impression an application could be refused basis on its proposed location.

Requiring discretionary approvals for every wind turbine application in HRM would consume significant staff, community, and Council resources. In addition, the processing times for these applications would be extended. For large scale wind turbine projects in particular, such a procedure would overlap with the Provincial EA process, thus entailing a duplication of effort.

Accordingly staff recommends that wind turbines be processed as-of-right, and that all requirements can be satisfied at the time of application for a development permit. It is recommended that there would be no case by case decision of Council on wind turbine applications.

Suitable Locations for Wind Turbines

A boundary line has been created to distinguish between urban and rural areas due to the substantial differences in how wind turbines are treated between these areas. This boundary has

been based primarily on the municipal servicing boundary plus areas designated for future residential growth in the RMPS.

Setback to Property Line

Employing a setback requirement to the property boundary is contentious for the wind energy industry in both urban and rural contexts. In the urban context wind developers suggest that employing a setback to the property boundary unduly hinders the ability to locate the towers in more locations where lot areas are smaller, therefore suggesting that the regulations create an uncompetitive environment. In response to this concern staff completed a series of analyses of areas randomly selected for Business Parks and selected Industrial Waterfront locations. The purpose of these exercises was to determine if in fact the setback to property line requirement would exclude sites from the ability to erect wind turbines. In some cases, on small lots, this was the case, however, in every area analyzed there were sites that were available that could accommodate all scale of turbines that are permitted in the area in question. Through the analysis it is clear that the areas in question are not uncompetitive and can accommodate wind turbines in many locations.

The purpose of the setback to property is for safety to adjacent properties in the unlikely event of a tower collapse. It is not sufficient to assume that the tower will never fail simply because the tower does not fail very often. A reasonable argument has been made to suggest that the investment that goes into most wind turbines is sufficient to ensure the tower's stability. However, there is currently no standardization in the industry for turbine base inspections at either the Municipal or Provincial levels in Nova Scotia beyond the requirements set out as part of the EA process. However as stated earlier the EA process only deals with wind turbine development above the 2 megawatts power generation level, which is essentially the largest category of wind turbine. This is a recognized gap. As a result the setback from the property line has been instituted as a matter of safety in the event of the improbable but possible failure of the turbine tower.

In the Rural areas of HRM a similar rationale exists but in this case the argument deals primarily with larger scale wind farm development and not so much at the smaller scales since the setback is a function of the tower height and rural lots are much larger than urban ones. The larger concern for wind farms and the setback to property line is when more than one property is involved in the same wind farm development. In this circumstance an artificial burden is created when the setback has to be met from either side of the property line. Accordingly it is recommended that when more than one property is used for the same wind farm a waiver to the setback to property line be permitted.

Municipal Inspections of Wind Turbines

There are two specific circumstances where the municipality is required to provide a municipal inspection function for wind turbines: 1) where a turbine is attached to a building and 2) where a stand alone wind turbine is not attached to the power grid.

Where a turbine is attached to a building the Municipality's Building Department may request information from a Professional Engineer to ensure that the stability of the wind turbine tower is sufficient as part of the structure.

Where a stand alone wind turbine is not part of the building structure and is not attached to the power grid, it is therefore not classified as a Public Utility and must be evaluated for its structural stability by the Municipality. Accordingly, the draft regulations include a provision which permits the Municipality's Building Department to request wind turbine design submission information to make that determination where it is deemed appropriate.

URBAN HRM

Suitable Locations for Urban Wind Turbines

In Urban HRM, wind turbines are proposed to be located in the new Urban Wind (UW-1) Zone. This zone is comprised exclusively of Business Parks and select Marine Industrial locations along the waterfront within the urban core. These areas are considered to be of sufficient distance to lessen impact to residential populations and are essentially day-time operations (working population) where the ambient noise is already higher than that in residential neighbourhoods.

For all other areas within Urban HRM it is recommended that the siting of wind turbine be prohibited. The rationale for the exclusion of wind turbines from residential areas is based primarily on the wide variation of machines and their relative impacts at various heights and power generation levels. Different machines produce more or less impact to adjacent properties making the prospect of wind turbines within proximity to residential communities a concern.

Staff is concerned that should there be a proliferation of wind turbine development within densely populated residential neighbourhoods, the cumulative impacts of the machines, particularly during over-night hours, may result in a significant "quality of life/ quiet enjoyment" issue.

In future, wind energy technology may make sufficient advancements to mitigate impacts from smaller scale wind turbines such that there may be an opportunity to integrate wind turbines into dense residential areas. However the desire to enable the community to realize the benefit of this technology without undue cost and impact is unavailable at present. Therefore, the recommendation is that this technology should be directed to lower impact areas where people do not sleep. Accordingly wind turbines should not be permitted in any other locations within the urban area. In order to achieve this, a new Restricted (R) Zone has been created.

Categories of Urban Wind Turbines

Of the four categories of wind turbines that have been created in the new policy (micro, small, medium, and large), the large category is considered incompatible in the selected locations within the Urban Area. Large wind turbines are used primarily to create wind farms for the sole

purpose of selling power back to the Utility as their principal purpose of operation. The other categories are typically considered to be used as supplemental sources of power to support other forms of land use. These categories are of a scale more appropriate to urban operations. Accordingly it is recommended that the three lower scales of Wind turbines be permitted in the designated Business Parks and select Marine Industrial Locations subject to appropriate distance separation and setback requirements.

Proposed Setback and Distance Separation Regulations for Urban Wind Turbines

In the urban areas, in Business Parks and select Marine Industrial locations, three distance requirements have been created including separation from a Wind turbine to:

1. a sensitive building;
2. a non sensitive building; and,
3. the property boundary.

A sensitive building is a building such as a dwelling unit, hotel, motel, hospital, nursing home or other building with overnight accommodations. In contrast, a non sensitive building is considered to be other forms of buildings such as an industrial use, an office building or a retail use. These distance requirements have been created to mitigate impacts including sound, to adjacent properties. Where a sensitive building where people sleep, such as a hotel, might be located in a business park a more stringent separation requirement should apply. However, there should also be a less stringent separation requirement to a non sensitive building such as a manufacturing operation.

In the areas identified for urban wind turbine siting, it has been considered that Business Parks and select Marine Industrial locations would produce ambient noise sufficient to mask sounds produced by turbine operations during daytime. The separation requirement from the turbine to adjacent buildings has been calculated based on two factors:

1. Using an absolute distance – for example machines in the medium category are proposed to be separated by a set distance (250 metres or 820 feet) to the nearest sensitive building; and,
2. Using the height of the machine as a measure of distance -- lower scale machines in the micro and small categories will have continued flexibility of location by using the height of the machine as the measure of the separation from either the property line or an adjacent building.

By using these two approaches a balance is achieved to provide flexibility for multiple sizes of wind turbines in the selected areas, while seeking to establish adequate distance to mitigate impacts from wind turbines to the more vulnerable land uses located nearby. The following Table 1.0 – Proposed Setbacks and Distance Separation Requirements for Urban Wind Turbines in the Urban Wind (UW-1) Zone identifies these proposed requirements.

Table 1.0 -- Proposed Setbacks and Distance Separation Requirements for Urban Wind Turbines in the Urban Wind (UW-1) Zone

Wind turbine Type (max. height)	Setbacks from Turbine -- Urban Wind Zone (Selected Areas Only include Business Parks and Commercial Campuses and selected Marine Industrial Locations.)		
	Property Boundary Lines	Adjacent Non – Sensitive Buildings	Adjacent Sensitive Buildings
Micro 23 metres (75 feet)	1.0 times height	1.5 times height	3.0 times height
Small 35 metres (115 feet)	1.0 times height	1.5 times height	180 metres (590 feet)
Medium 60 metres (197 feet)	1.0 times height	1.5 times height	250 metres (820 feet)
Large 60 metres (197 feet) plus	Not Permitted		

As seen in the table above, in addition to the separation requirements, a proposed setback from the wind turbines to a property boundary is also recommended. This setback is required to ensure that if the wind turbine tower were to fail, it would not impact abutting property. For this reason the setback from the turbine to the property boundary has been calculated based on the height of the wind turbine tower and is primarily for safety and protection of future adjacent land uses.

RURAL HRM

Suitable Locations for Urban Wind Turbines

In Rural HRM all four categories of wind turbines, micro, small, medium and large are proposed to be permitted subject to meeting setback and separation requirements. However wind turbines are not proposed to be permitted in the Restricted Zone. As stated previously, large wind turbines that meet or exceed 2 megawatts of power must undergo a Provincial EA process that may impact a proposed physical location and even enhance the municipal regulation for distance separation to a habitable building. However in no case will the EA process reduce the provisions of the HRM By-law.

The Restricted (R) Zone in the rural area prohibits wind turbine development, and is comprised of the following areas:

1. Regional Parks: as identified through the Regional Municipal Planning Strategy
2. Protected Areas: identified as designated wilderness reserves
3. Conservation Areas: that have been designated as incompatible for ground site disturbance
4. Western Commons: as identified through the Western Commons Master Plan

Distance Separation and Setback Regulations for Rural Wind Turbines

In Rural HRM the distance requirement and setbacks are treated differently than in Urban HRM. For example there are two requirements and not three:

1. Separation from all adjacent habitable buildings; and,
2. Setback to property line.

Unlike in the Urban Area, the separation requirement only applies to habitable buildings in the Rural Area. Habitable buildings are defined as those buildings where people sleep, such as a residence or a hospital. While the setback from the turbine to the property line would still apply, the separation requirements would not apply from the turbine to buildings that are non-habitable. That is, the distance separation requirement would not apply to an industrial or a commercial operation. This is because the purpose of the distance separation requirement is to mitigate impacts such as noise to more sensitive uses. Commercial and industrial operations produce ambient noise during daytime operations and people do not sleep there at night.

The setbacks to the property boundary are enhanced in the Rural Area to account for the existing flexibility in the Community LUBs. In the LUBs many properties in the Rural Area are permitted a wide range of land uses including buildings that would contain habitable and non-habitable uses. This means that future land uses on a given property could be converted to a building containing a habitable use. Accordingly the setback to the lot boundary is to ensure that the machine is more centrally located to the middle of the lot and away from the property boundary. This also provides a layer of mitigation to those properties that contain buildings with non-habitable uses.

This approach provides multiple options for size and scale of micro turbines and many of the setback requirements are a function of turbine tower height, it will allow a wind turbine owner greater opportunity to lower the tower height to reduce it. This provides a degree of flexibility for the turbine owner while at the same time mitigating the impact on neighbouring properties.

Waiver to Property Boundary

However, as stated earlier, setbacks to property lines are considered as a deterrent to large scale wind turbine development. This is most particularly problematic where a number of parcels are held in different ownership making internal property lines setbacks a key deterrent to wind farm development. For emerging cooperative arrangements where property owners do not wish to consolidate lots this is particularly problematic as these land owners may wish to retain ownership of their lands for additional uses such as agriculture. Therefore, in an effort to reduce regulations that would serve no practical purpose in this circumstance, the recommendations are

to include a waiver to the property line so that parcels held in separate ownership can connect to the same array to form part of a wind farm. However it should be noted that the requirement to maintain distance separation to habitable buildings would still be required.

The distance separation requirement from the wind turbine to a habitable building on an adjacent lot is a different measure than the setback to property boundary. In this case where the turbine contains a rotor blade that very large and the tower is very high it is appropriate to use an absolute distance such as in the case of a medium (250 metres or 820 feet) and a large wind turbine (550 metres or 1805 feet). It is anticipated that these distances will mitigate sound and other potential impacts from the wind turbine to more sensitive buildings.

The following Table 2.0 -- Proposed Setbacks and Distance Separation Requirements for Rural Wind Turbines in the Rural Wind (UW-2) Zone sets out these requirements.

Table 2.0 -- Proposed Distance Separation and Setbacks Requirements for Wind turbines in the Rural Wind (RW-2) Zone

Wind Turbine Type (maximum height)	Setbacks from Turbine-- Rural Wind (RW-2) Zone (Restricted from Regional Parks, Protected Areas, Conservation areas and the Western Commons)	
	Property Lines	All Adjacent Buildings
Micro 23 metres (75 feet)	2.0 times height	3.0 times height
Small 35 metres (115 feet)	2.0 times height	180 metres (590 feet)
Medium 60 metres (197 feet)	1.5 times height	250 metres (820 feet)
Large 60 metres (197 feet) plus	1.5 times height	550 m (1805 feet)

CONCLUSION

The aforementioned recommendations seek to balance the interest of HRM residents while reflecting both the increasing demand for wind energy in HRM and the scope of responsibility of the HRM and the Province. The proposed regulations reflect Municipal mandate and the processes that the Province have put in place to address environmental responsibilities.

BUDGET IMPLICATIONS

None at this time.

FINANCIAL MANAGEMENT POLICIES/BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved

Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

COMMUNITY ENGAGEMENT

The community engagement process is consistent with the intent of the HRM Community Engagement Strategy. The level of community engagement was consultation, achieved through 21 Public Meetings held between January 2007 and April 2010. A public hearing has to be held by Council before they can consider approval of any amendments.

The Public Meeting notices were posted on the HRM website, in the community and in the newspaper. Should Council decide to proceed with a Public Hearing on this application, in addition to the published newspaper advertisements, property owners that provided contact information on the public meeting sign in sheets will be notified.

ALTERNATIVES

- a) Council may choose to adopt the staff recommendation
- b) Council may choose to amend any or all of the proposed policies and regulations
- c) Council may choose to reject any or all of the proposed policies and regulations
- d) Council may choose to increase the proposed separation regulation for large wind turbines rather than institute a discretionary approval.

ATTACHMENTS

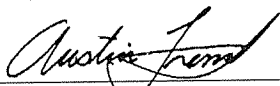
Attachment A - Proposed Regional Plan Policy Amendments

Attachment B - Typical Example of Dartmouth Community Land Use By-law Wind Energy Amendments and Wind Energy Zoning Map

A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/cagenda.html> then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Shayne Vipond, Senior Planner, 490-4335

Report Approved by:


Austin French, Manager of Planning Services, 490-6717

ATTACHMENT A

PROPOSED REGIONAL PLAN AMENDMENTS

The Halifax Regional Municipal Planning Strategy is hereby amended by:

1. Inserting in “CHAPTER 7: WATER, WASTEWATER, UTILITIES AND SOLID WASTE” pursuant to section “7.5.4.5. Community Energy Functional Plan” the new section 7.6 entitled “WIND ENERGY” as follows:

“WIND ENERGY IN NOVA SCOTIA

Demand for wind energy in Canada is growing at a rapid pace. Nova Scotia has one of the best documented wind resources in Canada. Wind energy is considered an abundant, renewable and nonpolluting energy resource in Nova Scotia. The use of wind turbines or wind energy facilities is considered by many to be a sustainable conversion of kinetic energy into electricity. The conversion of wind energy to electricity may reduce dependence on non-renewable energy sources and decrease the air and water pollution that results from the use of conventional energy sources. Wind energy is considered an important alternative source of sustainable and secure energy that has the potential to replace a measure of dependence on fossil fuels.

With the passage of The Electricity Act (May 2010), Nova Scotia has adopted aggressive renewable energy targets setting out a requirement that 25% of its total electrical power must be achieved through renewable energy technology by the year 2015. This is likely to be achieved in large part through the use of wind energy.

WIND ENERGY IN HRM

Wind Energy Facilities

Through the adoption of the Regional Plan and the Community Energy Functional Plan, HRM has recognized the need for alternative sustainable energy and more specifically, the creation of new policies for the siting of wind energy facilities in HRM. Wind energy facilities (otherwise known as wind turbines) can be of various heights and blade lengths (rotor diameters). These machines can be interconnected with other machines to form a wind farm, may be single stand alone machines, or may also be of roof mounted design. Due to the various heights and scales wind energy facilities should be regulated to reflect these differences.

Within the applicable Regional Plan policy designations, three new energy overlay zones have been created to reflect how wind energy facilities should be treated differently

between the urban and rural areas of HRM. The new energy zones in the urban and rural areas permit a range of wind energy facilities including micro, small, medium and large scale machines which have been classified based on different heights and levels of power generation. These range for large wind farms to smaller machines used as supplemental power sources for businesses and residences.

Location

Urban HRM

Wind energy facilities are regulated differently between urban and rural locations. Sensitive land uses such as dwelling units and hospitals and other buildings where people sleep should be sufficiently separated to mitigate impacts from wind energy facilities. Accordingly in the Urban HRM area, wind energy facilities will be restricted to selected areas only. These areas include designated business parks and commercial campuses, and some marine industrial locations. These areas are considered suitable for wind energy facilities based on the ability to provide adequate separation distance from the machines to more sensitive land uses such as residences and hospitals, and other places where persons sleep. In these designated areas, micro, small, and medium wind energy facilities are permitted. Large Utility scale wind energy facilities will not be permitted in the Urban HRM area, due primarily to the proximity of densely populated residential neighbourhood.

Rural HRM

Unlike urban HRM where wind energy facilities are permitted only in selected locations, wind energy facilities in rural HRM have the potential to locate in many areas provided that the facility is not proposed to be sited in the Restriction (R) Zone. In addition, the wind energy facility must meet distance requirements and all Provincial and Federal regulations were applicable. Areas within the Restricted (R) Zone that have been identified as environmentally sensitive and are therefore excluded from wind energy facility development include: provincially protected wilderness areas, Regional and Provincial Parks and the Western Commons. Access over lands in the Restricted Zone may be granted for purpose of creating a driveway to access non restricted lands for the purpose of large scale wind energy development.

These machines are often highly visible and can be controversial for members of the public, from the perspectives of aesthetics, sound levels and safety considerations, generating conflicting opinions and strong points of view. The Municipality recognizes that a portion of the public is predisposed to considering wind energy facilities in a negative light given the prominence and nature of the technology. However, the employment of typical regulatory tools such as Development Agreements and Site Plan Approvals, commonly used for managing other forms of land use development, are not

appropriate mechanisms to adequately address issues of visual and sound impact mitigation for wind energy facilities. Therefore, such facilities will be processed on an as-of-right basis, and methods to minimize potential negative impacts will be provided by means of Land Use By-law regulations, including prescribed minimum set-back distances from property boundaries and adjacent sensitive (eg. residential) uses.

Policy SU- 32

Within all Regional Plan Designations, HRM shall establish three overlay zones including an Urban Wind (UW-1) Zone, a Rural Wind (RE-2) Zone and a Restricted (R) Zone within the Land Use By-law to regulate wind energy facilities. These regulations will be implemented through the community land use by-laws. The Urban Wind Energy (UW-1) zone and the Rural Wind Energy (RE-2) Zone shall be applied to those areas where various categories of wind energy facilities shall be permitted in urban and rural areas. The Restricted (R) Wind Energy Zone shall be applied to the those areas where wind energy faculties shall be prohibited including Regional Parks, Conservation Areas, Protected Areas and the Western Commons and areas within Urban HRM not suitable for wind energy facilities.

Policy SU- 33

HRM shall establish application requirements within the applicable Land Use By-laws wind energy performance standards and regulations to control height, scale, access, setback and separation distances of such facilities in order to adequately address operational needs, safety concerns and the mitigation of impacts to adjacent properties

Expansion of Wind Energy Facilities

Wind turbines should be permitted in HRM without placing a limit on the number of wind turbines within a particular location provided that distance separation requirements can be met. However where a property abuts another or where a number of properties are contiguous and are intended to be used to connect into the same large wind energy facility, the setback requirement from the property boundary may be waived where the adjoining property forms part of the same wind farm.

Policy SU- 34

HRM seeks to encourage the development of large scale wind energy facilities in rural areas by permitting the expansion of wind farms in suitable locations. Accordingly, where a large scale wind turbine is proposed to connect to a wind energy facility on an adjacent lot, the setback requirement from the property

boundary may be waived where the adjoining property forms part of the same wind farm.

Future Amendments

At present, a wind energy facility producing 2 Megawatts of power or more is required to undergo a Provincial Environmental Assessment in Nova Scotia. The Municipality recognizes that municipal regulations duplicating Provincial and/or Federal requirements should be minimized so as not to unduly hinder wind energy development.

The Municipality further recognizes that the Provincial Environmental Assessment process guidelines may change over time which could necessitate changes to municipal regulations in order to remain both consistent and complimentary. Accordingly, the Municipality may seek to amend the municipal regulations to ensure that future requirements are adequate to regulate wind energy facilities in HRM.

Policy SU –35

HRM shall seek to ensure that Federal and Provincial processes comply with municipal requirements for large scale wind energy facility development. Where Federal and Provincial regulations have been amended, HRM may also amend municipal land use by-law regulations to remain consistent with these changes.

A similar rationale is used for the rapid advancement of wind energy technology. Such advancements could necessitate an amendment to the municipal regulations. If it is deemed appropriate the Municipality may seek to amend the municipal regulations to ensure that requirements are adequate to regulate wind energy facilities in HRM.

Policy SU- 36

HRM shall seek to recognize advances in wind energy technology and wind energy standards and may amend wind turbine municipal land use by-law regulations to reflect these changes.”

ATTACHMENT B

TYPICAL EXAMPLE -- DARTMOUTH COMMUNITY LAND USE BY-LAW WIND ENERGY AMENDMENTS

The Land Use By-law for Dartmouth is hereby amended by:

1. Inserting in “Section 2 General Provisions”, a new subsection “32 G WIND ENERGY FACILITIES” as follows:

“32G WIND ENERGY FACILITIES

The use of windmills or wind turbines to produce electricity or for any other purpose shall be regulated in accordance with the provisions of this Section.

I DEFINITIONS

For the purposes of this Section, certain terms are defined as follows:

- a) “Habitable Building” means a dwelling unit, hospital, hotel, motel, nursing home or other building where a person lives or which contains overnight accommodations.
- b) “Nacelle” means the frame and housing at the top of the tower that encloses the gearbox and generator.
- c) “Nameplate Capacity” means the manufacturer’s maximum rated output of the electrical generator found in the nacelle of the wind turbine;
- d) “Total Rated Capacity” means the maximum rated output of all the electrical generators found in the nacelles of the wind turbines used to form a wind energy facility;
- e) “Tower Height” means the distance measured from grade at the established grade of the tower to the highest point of the turbine rotor or tip of the turbine blade when it reaches its highest elevation, or in the case of a roof mounted wind turbine the distance measured from the lowest point of established grade at the building’s foundation to the highest point of the turbine rotor or tip of the turbine blade when it reaches its highest elevation;
- f) “Turbine” means a wind energy conversion system, the purpose of which is to produce electricity, consisting of rotor blades, associated control or conversion electronics, and other accessory structures.
- g) “Wind Energy Facility” means a wind energy conversion system, the purpose of which is to produce electricity, consisting of one or more roof mounted turbines or turbine towers, with rotor blades, associated control or conversion electronics, and other accessory structures including substations, meteorological towers, electrical infrastructure and transmission lines;

- i) “Micro Facility” means a wind energy facility consisting of a single turbine designed to supplement other electricity sources as an accessory use to existing buildings or facilities and has a total rated capacity of 10 kW or less, and is not more than 23 metres (75 feet) in height.
- ii) “Small Facility” means a wind energy facility consisting of a single turbine designed to supplement other electricity sources as an accessory use to existing buildings or facilities and has a total rated capacity of more than 10 kW but not greater than 50 kW. A Small Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the tower of which is not more than 35 metres (115 feet) in height.
- iii) “Medium Facility” means a wind energy facility which has a total rated capacity of more than 50 kW but not greater than 300 kW. A Medium Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the towers of which are not more than 60 metres (197 feet) in height.
- iv) “Large Facility” means a wind energy facility which has a total rated capacity of more than 300 kW. A Large Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the towers of which are greater than 60 metres (197 feet) in height.

II ZONES

For the purpose of this section the following zones apply as shown on the attached Schedule A-1 - Wind Energy Zoning Map. Such zones are:

- (UW-1) Urban Wind Zone
- (RW-2) Rural Wind Zone
- (R) Restricted Zone

a) URBAN WIND ZONE (UW-1)

- i) All Wind Energy Facilities, except Large Facilities, are permitted in the Urban Wind Zone (UW-1).
- ii) All turbine towers in the UW-1 Zone shall be set back a minimum distance of 1.5 times the tower height from any building on an adjacent property, and shall have a minimum distance between turbines equal to the height of the tallest tower
 - 1. However the minimum setback shall not apply from the turbine tower to an accessory building on an adjacent property,
- iii) All turbine towers in the UW-1 Zone shall be set back a minimum distance of 1.0 times the tower height from any adjacent property boundary,

- iv) Turbine towers of Micro Facilities in the UW-1 Zone shall be set back a minimum distance of 3.0 times the tower height from any habitable building on an adjacent property.
- v) Turbine towers of Small Facilities in the UW-1 Zone shall be set back a minimum distance of 180 metres (590 feet) from any habitable building on an adjacent property.
- vi) Turbine towers of Medium Facilities in the UW-1 Zone shall be set back a minimum distance of 250 metres (820 feet) from any habitable building on an adjacent property.

b) RURAL WIND ZONE (RW-2)

- i) All Wind Energy Facilities are permitted in the Rural Wind Zone (RW-2).
- ii) All turbine towers in the RW-2 Zone shall be set back a minimum distance of 1.5 times the tower height from any building on an adjacent property, and shall have a minimum distance between turbines equal to the height of the tallest tower,
 - 1. However the minimum setback shall not apply from the turbine tower to an accessory building on an adjacent property.
- iii) Turbines towers of Micro Facilities in the RW-2 Zone shall have the following set back requirements:
 - (1) A minimum distance of 3.0 times the tower height from any habitable building on an adjacent property;
 - (2) A minimum distance of 2.0 times the tower height from any adjacent property boundary.
- iv) Turbines towers of Small Facilities in the RW-2 Zone shall have the following set back requirements:
 - (1) A minimum distance of 180 metres (590 feet) from any habitable building on an adjacent property;
 - (2) A minimum distance of 2.0 times the tower height from any adjacent property boundary.
- v) Turbines towers of Medium Facilities in the RW-2 Zone shall have the following set back requirements:
 - (1) A minimum distance of 250 metres (820 feet) from any habitable building on an adjacent property;
 - (2) A minimum distance of 1.5 times the tower height from any adjacent property boundary.

- vi) Turbines towers of Large Facilities in the RW-2 zone shall have the following set back requirements:
 - (1) A minimum distance of 550 metres (1805 feet) from any habitable building on an adjacent property;
 - (2) A minimum distance of 1.5 times the tower height from any adjacent property boundary.
- c) **RESTRICTED ZONE (R)**
 - i) Wind Energy Facilities shall not be permitted in the Restricted Zone.

III PERMIT APPLICATION REQUIREMENTS

All Wind Energy Facilities require a development permit. The permit application shall contain the following:

- a) a description of the proposed Wind Energy Facility, including an overview of the project; the proposed total rated capacity of the Wind Energy Facility;
- b) the proposed number, representative types, and height or range of heights of wind turbines towers to be constructed, including their generating capacity, dimensions, respective manufacturers, and a description of accessory facilities;
- c) identification and location of the properties on which the proposed Wind Energy Facility will be located;
- d) at the discretion of the Development Officer, a survey prepared by a Nova Scotia Land Surveyor, a surveyor's certificate, or a site plan showing the planned location of all wind turbines towers, property lines, setback lines, access roads, turnout locations, substation(s), electrical cabling from the Wind Energy Facility to the substation(s), ancillary equipment, building(s), transmission and distribution lines. The site plan must also include the location of all structures and land parcels, demonstrating compliance with the setbacks and separation distance where applicable;
- e) at the discretion of the Development Officer, proof of notification to the Department of National Defense, NAV Canada, Natural Resources Canada and other applicable agencies regarding potential radio, telecommunications, radar and seismoacoustic interference, if applicable, to Transport Canada and the *Aviation Act*; and,
- f) any other relevant information as may be requested by the Halifax Regional Municipality to ensure compliance with the requirements of this By-law.

IV ADDITIONAL PERMIT REQUIREMENTS

- a) The Development Permit application shall be reviewed by a Municipal Building Official to determine if design submissions are required from a Professional Engineer to ensure that the wind turbine base, foundation, or guy wired anchors required to

maintain the structural stability of the wind turbine tower(s) are sufficient where a wind turbine is:

- a. not attached to a building and is not connected to the power grid and,
- b. attached to an accessory building in excess of 215 square feet and is not connected to the power grid.

V EXCEPTIONS

Notwithstanding Section II a) and II b) the setback requirements from any Wind Energy Facility to a property boundary may be waived where the adjoining property is part of and forms the same Wind Energy Facility. All other setback provisions shall apply.

- a) Wind Energy Facilities shall not be permitted in the following zones of the Dartmouth Land Use By-law:
 - a. RPK (Regional Park) Zone.

VII INSTALLATION AND DESIGN

- a) The installation and design of a Wind Energy Facility shall conform to applicable industry standards.
- b) All structural, electrical and mechanical components of the Wind Energy Facility shall conform to relevant and applicable local, provincial and national codes.
- c) All electrical wires shall, to the maximum extent possible, be placed underground.
- d) The visual appearance of the Wind Energy Facility shall at a minimum:
 - i) be a non-obtrusive colour such as white, off-white or gray;
 - ii) not be artificially lit, except to the extent required by the *Federal Aviation Act* or other applicable authority that regulates air safety; and,
 - iii) not display advertising (including flags, streamers or decorative items), except for identification of the turbine manufacturer, facility owner and operator.

VIII MISCELLANEOUS

- a) Micro Wind Facilities shall be permitted on buildings subject the requirements in Section II a) Urban Wind Requirements and Section II b) Rural Wind Requirements.
- b) The siting of Wind Energy Facilities is subject to the requirements for Watercourse Setbacks and Buffers as set out in the Land Use By-law.
- c) The siting of all accessory buildings are subject to the general set back provisions for buildings under this By-law

VIII SCHEDULES

- a) Schedule - Map A-1 – Wind Energy Zoning Map

ATTACHMENT B

TYPICAL EXAMPLE -- DARTMOUTH COMMUNITY LAND USE BY-LAW WIND ENERGY AMENDMENTS

The Land Use By-law for Dartmouth is hereby amended by:

1. Inserting in “Section 2 General Provisions”, a new subsection “32 G WIND ENERGY FACILITIES” as follows:

“32G WIND ENERGY FACILITIES

The use of windmills or wind turbines to produce electricity or for any other purpose shall be regulated in accordance with the provisions of this Section.

I DEFINITIONS

For the purposes of this Section, certain terms are defined as follows:

- a) “Habitable Building” means a dwelling unit, hospital, hotel, motel, nursing home or other building where a person lives or which contains overnight accommodations.
- b) “Nacelle” means the frame and housing at the top of the tower that encloses the gearbox and generator.
- c) “Nameplate Capacity” means the manufacturer’s maximum rated output of the electrical generator found in the nacelle of the wind turbine;
- d) “Total Rated Capacity” means the maximum rated output of all the electrical generators found in the nacelles of the wind turbines used to form a wind energy facility;
- e) “Tower Height” means the distance measured from grade at the established grade of the tower to the highest point of the turbine rotor or tip of the turbine blade when it reaches its highest elevation, or in the case of a roof mounted wind turbine the distance measured from the lowest point of established grade at the building’s foundation to the highest point of the turbine rotor or tip of the turbine blade when it reaches its highest elevation;
- f) “Turbine” means a wind energy conversion system, the purpose of which is to produce electricity, consisting of rotor blades, associated control or conversion electronics, and other accessory structures.
- g) “Wind Energy Facility” means a wind energy conversion system, the purpose of which is to produce electricity, consisting of one or more roof mounted turbines or turbine towers, with rotor blades, associated control or conversion electronics, and other accessory structures including substations, meteorological towers, electrical infrastructure and transmission lines;

- i) “Micro Facility” means a wind energy facility consisting of a single turbine designed to supplement other electricity sources as an accessory use to existing buildings or facilities and has a total rated capacity of 10 kW or less, and is not more than 23 metres (75 feet) in height.
- ii) “Small Facility” means a wind energy facility consisting of a single turbine designed to supplement other electricity sources as an accessory use to existing buildings or facilities and has a total rated capacity of more than 10 kW but not greater than 50 kW. A Small Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the tower of which is not more than 35 metres (115 feet) in height.
- iii) “Medium Facility” means a wind energy facility which has a total rated capacity of more than 50 kW but not greater than 300 kW. A Medium Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the towers of which are not more than 60 metres (197 feet) in height.
- iv) “Large Facility” means a wind energy facility which has a total rated capacity of more than 300 kW. A Large Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the towers of which are greater than 60 metres (197 feet) in height.

II ZONES

For the purpose of this section the following zones apply as shown on the attached Schedule A-1 - Wind Energy Zoning Map. Such zones are:

- (UW-1) Urban Wind Zone
- (RW-2) Rural Wind Zone
- (R) Restricted Zone

a) URBAN WIND ZONE (UW-1)

- i) All Wind Energy Facilities, except Large Facilities, are permitted in the Urban Wind Zone (UW-1).
- ii) All turbine towers in the UW-1 Zone shall be set back a minimum distance of 1.5 times the tower height from any building on an adjacent property, and shall have a minimum distance between turbines equal to the height of the tallest tower
 - 1. However the minimum setback shall not apply from the turbine tower to an accessory building on an adjacent property,
- iii) All turbine towers in the UW-1 Zone shall be set back a minimum distance of 1.0 times the tower height from any adjacent property boundary,

- iv) Turbine towers of Micro Facilities in the UW-1 Zone shall be set back a minimum distance of 3.0 times the tower height from any habitable building on an adjacent property.
- v) Turbine towers of Small Facilities in the UW-1 Zone shall be set back a minimum distance of 180 metres (590 feet) from any habitable building on an adjacent property.
- vi) Turbine towers of Medium Facilities in the UW-1 Zone shall be set back a minimum distance of 250 metres (820 feet) from any habitable building on an adjacent property.

b) RURAL WIND ZONE (RW-2)

- i) All Wind Energy Facilities are permitted in the Rural Wind Zone (RW-2).
- ii) All turbine towers in the RW-2 Zone shall be set back a minimum distance of 1.5 times the tower height from any building on an adjacent property, and shall have a minimum distance between turbines equal to the height of the tallest tower,
 - 1. However the minimum setback shall not apply from the turbine tower to an accessory building on an adjacent property.
- iii) Turbines towers of Micro Facilities in the RW-2 Zone shall have the following set back requirements:
 - (1) A minimum distance of 3.0 times the tower height from any habitable building on an adjacent property;
 - (2) A minimum distance of 2.0 times the tower height from any adjacent property boundary.
- iv) Turbines towers of Small Facilities in the RW-2 Zone shall have the following set back requirements:
 - (1) A minimum distance of 180 metres (590 feet) from any habitable building on an adjacent property;
 - (2) A minimum distance of 2.0 times the tower height from any adjacent property boundary.
- v) Turbines towers of Medium Facilities in the RW-2 Zone shall have the following set back requirements:
 - (1) A minimum distance of 250 metres (820 feet) from any habitable building on an adjacent property;
 - (2) A minimum distance of 1.5 times the tower height from any adjacent property boundary.

- vi) Turbines towers of Large Facilities in the RW-2 zone shall have the following set back requirements:
 - (1) A minimum distance of 550 metres (1805 feet) from any habitable building on an adjacent property;
 - (2) A minimum distance of 1.5 times the tower height from any adjacent property boundary.
- c) **RESTRICTED ZONE (R)**
 - i) Wind Energy Facilities shall not be permitted in the Restricted Zone.

III PERMIT APPLICATION REQUIREMENTS

All Wind Energy Facilities require a development permit. The permit application shall contain the following:

- a) a description of the proposed Wind Energy Facility, including an overview of the project; the proposed total rated capacity of the Wind Energy Facility;
- b) the proposed number, representative types, and height or range of heights of wind turbines towers to be constructed, including their generating capacity, dimensions, respective manufacturers, and a description of accessory facilities;
- c) identification and location of the properties on which the proposed Wind Energy Facility will be located;
- d) at the discretion of the Development Officer, a survey prepared by a Nova Scotia Land Surveyor, a surveyor's certificate, or a site plan showing the planned location of all wind turbines towers, property lines, setback lines, access roads, turnout locations, substation(s), electrical cabling from the Wind Energy Facility to the substation(s), ancillary equipment, building(s), transmission and distribution lines. The site plan must also include the location of all structures and land parcels, demonstrating compliance with the setbacks and separation distance where applicable;
- e) at the discretion of the Development Officer, proof of notification to the Department of National Defense, NAV Canada, Natural Resources Canada and other applicable agencies regarding potential radio, telecommunications, radar and seismoacoustic interference, if applicable, to Transport Canada and the *Aviation Act*; and,
- f) any other relevant information as may be requested by the Halifax Regional Municipality to ensure compliance with the requirements of this By-law.

IV ADDITIONAL PERMIT REQUIREMENTS

- a) The Development Permit application shall be reviewed by a Municipal Building Official to determine if design submissions are required from a Professional Engineer to ensure that the wind turbine base, foundation, or guy wired anchors required to

maintain the structural stability of the wind turbine tower(s) are sufficient where a wind turbine is:

- a. not attached to a building and is not connected to the power grid and,
- b. attached to an accessory building in excess of 215 square feet and is not connected to the power grid.

V EXCEPTIONS

Notwithstanding Section II a) and II b) the setback requirements from any Wind Energy Facility to a property boundary may be waived where the adjoining property is part of and forms the same Wind Energy Facility. All other setback provisions shall apply.

- a) Wind Energy Facilities shall not be permitted in the following zones of the Dartmouth Land Use By-law:
 - a. RPK (Regional Park) Zone.

VII INSTALLATION AND DESIGN

- a) The installation and design of a Wind Energy Facility shall conform to applicable industry standards.
- b) All structural, electrical and mechanical components of the Wind Energy Facility shall conform to relevant and applicable local, provincial and national codes.
- c) All electrical wires shall, to the maximum extent possible, be placed underground.
- d) The visual appearance of the Wind Energy Facility shall at a minimum:
 - i) be a non-obtrusive colour such as white, off-white or gray;
 - ii) not be artificially lit, except to the extent required by the *Federal Aviation Act* or other applicable authority that regulates air safety; and,
 - iii) not display advertising (including flags, streamers or decorative items), except for identification of the turbine manufacturer, facility owner and operator.

VIII MISCELLANEOUS

- a) Micro Wind Facilities shall be permitted on buildings subject the requirements in Section II a) Urban Wind Requirements and Section II b) Rural Wind Requirements.
- b) The siting of Wind Energy Facilities is subject to the requirements for Watercourse Setbacks and Buffers as set out in the Land Use By-law.
- c) The siting of all accessory buildings are subject to the general set back provisions for buildings under this By-law

VIII SCHEDULES

- a) Schedule - Map A-1 – Wind Energy Zoning Map