

To: **Inverness County Planning Advisory Committee  
Inverness County Council**

From: **Planning Staff (EDPC)**

Date: **July 6, 2023**

Reference: **County of Inverness' Municipal Planning Strategy and Land Use By-law Concerning  
the Regulation of Wind Turbine Development – Policy Recommendations**

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**Recommendation:**

That Inverness County Council **approve** the proposed amendments to the Municipal Planning Strategy and Land Use By-law Concerning the Regulation of Wind Turbine Development to increase setback distances for Utility Scale Wind Turbines to 1 km and add a setback table that considers the number of wind turbines in a wind turbine farm with a generating capacity of 2 megawatts or more and insert accompanying definitions.

***Setbacks***

Inverness County presently only has a setback of 600 m (1,969 feet) for Utility Wind Turbine(s) and neither considers wind turbines of the size requiring an Environmental Assessment nor the number of turbines in a wind farm near a dwelling.

Antigonish County, Richmond County and Victoria County all have provisions for setbacks of 1,000 m (3,280 feet) from residences. Antigonish County and Richmond County have this setback from residences for wind turbine developments with a total rated capacity greater than two (2) megawatts, or turbines requiring an Environmental Assessment while Victoria County has this setback from residences for wind turbine developments with a total rated capacity of more than 100 kW. Inverness County only has a basic setback from residences of 600 metres (1,969 feet) for Utility Wind Turbines.

Colchester County analyzed 22 Land Use By-laws regarding the regulation of the development of wind energy and found the highest setback distance implemented was 1,000 m. In January 2022, Colchester County placed a moratorium on wind turbine development within the county as the Municipality reviewed its by-laws regarding wind turbines. On February 2023, Colchester County adopted a wind turbine development by-law which implemented a 1.0 km setback for large scale wind turbines (the Inverness County equivalent to utility scale wind turbines) up to 100 metres in height; a 2.0 km setback for large scale wind turbines exceeding 100 metres in height and an additional 7.5 metres of setback for every 1 metre a large scale wind turbine exceeds 200m in height.

Cumberland County also recently amended the wind turbine regulations in their Municipal Planning Strategy & Land Use Bylaw. The amendments made based on their research and review

were adopted in September 2022. Cumberland County implemented a separation distance of a minimum of 1,000 metres or 3.5 times the height of the turbine, whichever is larger, from a largescale setback to a habitable building.

Based on existing and new examples of policy within the province regarding wind turbine policies and regulations, at minimum a setback of 1,000 metres from a utility scale wind turbine to a dwelling or residence should be implemented. This setback is further backed by research conducted by Staff.

When discussing wind turbine effects on human health it is important to mention that a Health Canada study (last modified in 2014) found no direct link between wind turbine noise and adverse health problems in people. However, Wind Turbines and Wind Turbine Noise are statistically associated with annoyance. The study goes on to say that it is this Wind Turbine Noise annoyance that is related to several self-reported health effects including but not limited blood pressure, tinnitus, dizziness, disturbed sleep, migraines, and perceived stress. Yet, the above associations were not dependent on the level of noise or distance from the turbines and were also observed in many cases of road traffic noise annoyance.

However, having adequate setbacks should help reduce community annoyance. In the 2014 Health Canada study regarding WTN and Health, community annoyance was observed to drop at distances between 1km to 2km in Ontario, compared to PEI where almost all the participants who were highly annoyed by Wind Turbine Noise lived within 550m of a wind turbine. It should be noted that Inverness County's present setback of Utility Wind Turbines is only 50m more than the maximum distance residents in PEI who were highly annoyed by Wind Turbine Noise were from a turbine.

Another common concern noted was about infrasound produced by wind turbines. Infrasound refers to sounds with a frequency of less than 20 Hz. According to the Health Canada study (last modified in 2014):

- "Infrasound could some sometimes be measured up to 10km but were in many cases below background infrasound levels"
- Infrasound levels begin decreasing significantly starting at 1km from the wind turbine
- "Infrasound levels measures near the base of wind turbines were around the threshold of audibility that has been reported for about 1% of people that have the most sensitive hearing"

Given this information, Staff feel that a minimum setback of 1.0 km from Utility Scale Wind Turbines should be a mandatory minimum.

In addition to general setbacks implemented based on the nameplate capacity of a wind turbine, Staff have noticed that there are no regulations regarding setbacks in relation to the number or

wind turbines in a wind farm near a residence or dwelling. Complaints about adverse health affects and wind turbine annoyance are more likely to be raised when concerning a wind farm.

Health Canada acknowledges that many factors influence Wind Turbine Noise experienced by a residence, including wind turbine characteristics and the number of turbines at any given distance.

As per their studies example:

*“To illustrate, two similar homes may exist in similar environments located the same distance from the nearest turbine operating in areas with 1 small and 75 large wind turbines respectively. These homes would be treated the same if the analysis was conducted using only distance to the nearest wind turbine, however they would be completely different in terms of their WTN exposure level...”*

This information demonstrates that policy should consider the number of turbines within a certain area of a residence. It may also indicate that previous setbacks have been inadequate because the setback was not increased based on the number of wind turbines sited near a residence and therefore did not consider the combined impacts of multiple turbines a residence experienced. Figure 5 shows the setback distances for multiple turbines based on the number of turbines and loudest turbine sound power level for turbines within a 3.0 km radius of the house/dwelling.

The Province of Ontario acknowledges that a home or property could face combined impacts from the siting of multiple utility scale wind turbines within a 3km radius. In the Province of Ontario, more utility scale turbines within a 3km radius of the house/dwelling will result in larger required setback distances from the nearest turbine. Figure 2 shows the setback distances for multiple turbines based on the number of turbines and loudest turbine sound power level for turbines within a 3.0 km radius of the house/dwelling as required by the Province of Ontario.

**Figure 2. Setback Distances for Multiple Turbines Within a 3km Radius**

Sound power level	1 to 5 turbines within 3km	6 to 10 turbines within 3km	11 to 25 turbines within 3km	26+ turbines within 3km
102 dBA	550 m	650 m	750 m	Noise study required
103-104 dBA	600 m	700 m	850 m	Noise study required
105 dBA	850 m	1000 m	1250 m	Noise study required
106-107 dBA	950 m	1200 m	1500 m	Noise study required
	Noise study required	Noise study required	Noise study required	Noise study required

Following this policy example and the rationale provided by the Health Canada study (last modified in 2014), Staff are recommending the implementation of setbacks based on the number of wind turbines in a proposed wind turbine farm with a total rated capacity of 2 megawatts or

more. Given the size of the structures as well as the significant infrastructure and capital required for construction and servicing, Staff expect most wind farms will be comprised of utility scale wind turbines. It is these wind farms that tend to generate public concern due to their size, which affects their visibility and the potential of shadow flicker, and generating capacity which increases the output of wind turbine noise.

Staff are proposing the table below in Figure 3 as the setbacks to be implemented based on the number of wind turbines in a proposed wind turbine farm with a total rated capacity of 2 megawatts or more:

<b>Figure 1: Proposed Setbacks Based on Existing Policy &amp; Best Practices</b>	
<b>Number of Wind Turbines in a Wind Turbine Project with a Total Rated Capacity of 2 Megawatts or More</b>	<b>Proposed Setback</b>
2 – 5 Wind Turbines	1 km
6– 10 Wind Turbines	1.2 km
11 – 25 Wind Turbines	1.5 km
26 (+) Wind Turbines	Require a Noise Study to Determine Setbacks

These setbacks are based on the setbacks utilized by the Province of Ontario. This chart takes the highest numerical setback recommendation for the number of wind turbines category in order to simplify implementation.

In addition to the above reasons for implementing stronger setbacks, some public concerns can be indirectly addressed through the consideration of wind turbines. For example, the aesthetic impacts of wind turbines are subjective and decreased in property value are not under the scope of planning concerns, but consideration to these concerns could be given in the determination of setbacks.

**Conclusions:**

Based on the research in the supplementary Staff Report, Staff have noted that Inverness County’s MPS and LUB Concerning the Regulation of Wind Turbine Development should be updated with stronger policies regarding requirements for Utility Wind Turbines, especially projects over 2.0 megawatts or requiring Environmental Assessment Approval.

In the interim, increasing setbacks may act as a stopgap while a more thorough policy analysis and consultation process is conducted. Therefore, Staff recommend that Inverness County Council approve the proposed amendments to the Municipal Planning Strategy and Land Use By-law Concerning the Regulation of Wind Turbine Development to increase setback distances for

Utility Scale Wind Turbines to 1 km and add a setback table that considers the number of wind turbines in a wind turbine farm with a generating capacity of 2 megawatts or more and insert accompanying definitions.

**Proposed Motions:**

Planning Advisory Committee

That the Planning Advisory Committee recommends to Municipal Council to approve the proposed amendments to the Municipal Planning Strategy and Land Use By-law Concerning the Regulation of Wind Turbine Development to increase setback distances for Utility Scale Wind Turbines to 1 km and add a setback table that considers the number of wind turbines in a wind turbine farm with a generating capacity of 2 megawatts or more and insert accompanying definitions; and

That Council give First Reading and schedule a Public Hearing.

Council – Second Reading

That Municipal Council approve the proposed amendments to the Municipal Planning Strategy and Land Use By-law Concerning the Regulation of Wind Turbine Development to increase setback distances for Utility Scale Wind Turbines to 1 km and add a setback table that considers the number of wind turbines in a wind turbine farm with a generating capacity of 2 megawatts or more and insert accompanying definitions.

**Appendix A: Amending Pages**

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A BYLAW TO AMEND THE INVERNESS COUNTY MUNICIPAL PLANNING STRATEGY CONCERNING THE REGULATION OF WIND TURBINE DEVELOPMENT

The Municipal Planning Strategy for Inverness County Concerning the Regulation of Wind Turbine Development is hereby amended by:

- 1. The "Table of Contents" is hereby amended by adding the following section in bold and renumbering the subsequent pages accordingly:

Table of Contents

...

2.4 Wind Farms..... 8

- 2. Adding to the following text in bold to Policy R-4 the subsequent:

Policy R-4

It shall be the policy of Council to establish, within the General Resource Designation, the General Resource (GR-1) Zone in the Land Use By-law. It shall be the policy of Council to permit within the General Resource Zone both domestic-scale and utility-scale wind turbines and wind farms as of right and by way of development permit. All other uses, with the exception of wind turbines, shall also be permitted as of right, and while they will not be subject to a development permit under this plan, some developments falling within the jurisdiction of a Secondary Planning Strategy may require a development permit as per that Secondary Planning Strategy.

- 3. Adding to the following text in bold to Policy R-5 the subsequent:

Policy R-5

Council shall establish minimum lot size and setback requirements from all property lines for wind turbines in the General Resource (GR-1). Notwithstanding this minimum setback requirement, where a domestic scale wind turbine development is proposed on a lot where the immediately adjacent property is subject to a long-term lease for the domestic wind turbine use, the setback requirement for the turbine from a property line shall not apply. Notwithstanding this minimum setback requirement, where a wind farm has a total rated capacity of 2 MW or more, the setback requirement will be subject to Policy R-10.

- 4. Adding the following section immediately after Section 2.3: "Utility Scale Wind Turbines" and renumbering the section accordingly:

2.4 Wind Farms

Wind farms shall be defined as a grouping of more than one interconnected wind turbines on one lot or abutting lots used for the purpose of converting wind power to produce electricity. Wind farms typically require a central computerized monitoring system that monitors the operation of the turbines.

As referenced in the Utility Scale Wind Turbine section, Council expects most wind farms to be comprised of utility scale wind turbines and have a total rated capacity of 2 MW or more.

Nova Scotia Power is aiming for 80% renewable energy by 2030 and the Province of Nova Scotia is aiming to have net zero greenhouse gas emissions by 2050. This means the demand for wind energy will only increase. According to prior wind mapping, Cape Breton holds significant potential for wind energy projects.

Council recognizes that a home or property could face cumulative effects from the siting of multiple turbines in an adjacent wind farm. Council believes that a greater setback from homes in relation to the number of wind turbines in a proposed wind farm project that has a total rated capacity of 2 MW or more should be implemented. Council believes this approach will provide a strong framework for wind farm development in the future and is in line with recommended best practice to help mitigate any wind turbine annoyance homeowners may experience from wind farm development.

In keeping with Council's original intent to regulate only wind turbine development, the setback requirements will not apply to future residential growth locating closely or relatively closely to existing turbines. Council's position is that homeowners who do so will be fully aware of the distance their residence will be to a turbine and will have accepted any adverse effects, if any, that the turbine may have on them. The same is true of future purchasers of these residences. Existing wind turbine development that does not meet the setback requirements will be allowed to continue as non-conforming structures, but an expansion resulting in further reduction of setbacks will not be permitted.

**Policy R-10**

**Council shall establish setback requirements for wind turbines in a wind farm with a total rated capacity of 2 megawatts or more from all residences based on the number of wind turbines in the wind farm in the General Resource (GR-1). Notwithstanding this minimum setback requirement, where a wind turbine development is proposed on a lot where the immediately adjacent property is subject to a long-term lease for the domestic wind turbine use, the setback requirement for the turbine from a residence shall not apply.**

**A BY-LAW TO AMEND THE INVERNESS COUNTY LAND USE BY-LAW  
CONCERNING THE REGULATION OF WIND TURBINE DEVELOPMENT**

The Land Use By-law is hereby amended by removing the following text shown in strikethrough and by adding the following text shown in bold to:

1. Part 4 of the Table of Contents:

...

PART 4	GENERAL RESOURCE (GR-1) ZONE .....	8
	USES PERMITTED AND NOT SUBJECT TO DEVELOPMENT PERMITS.....	8
	USES PERMITTED AND SUBJECT TO DEVELOPMENT PERMITS.....	8
	REQUIREMENTS RELATING TO DOMESTIC SCALE WIND TURBINES.....	8
	REQUIREMENTS RELATING TO UTILITY SCALE WIND TURBINES.....	8
	<b>REQUIREMENTS RELATING TO WIND FARMS (2 MEGAWATTS OR MORE).....</b>	<b>9</b>
	SPECIAL PROVISIONS.....	9

2. Part 3: “Interpretation” of the Land Use By-law:

**INTERPRETATION OF CERTAIN WORDS**

3.1 In this By-law, words used in the present tense include future; words in the singular number include the plural except where otherwise clearly stated; words in the plural include the singular number; and the word “used” includes “arranged,” designed or intended to be used.” The word “shall” is mandatory and the word “may” is permissive. All other words carry their customary meaning except for those defined in Part 5 6 of this By-law, entitled “Definitions.”

3. Subsection 4.2: “Uses Permitted and Subject to Development permits”:

4.2 Notwithstanding Section 4.1 of this By-law, the following use shall be permitted in the GR-1 Zone subject to development permit:

- a) Domestic scale wind turbines; ~~and~~,
- b) Utility scale wind turbines; ~~;~~ **and**
- c) **Wind Turbine Farms.**

4. Part 4: “General Resource (GR-1) Zone” of the Land Use By-law is hereby amended by removing the following text shown in strikethrough and adding the following text in bold to Subsection 4.4:

**REQUIREMENTS RELATING TO UTILITY SCALE WIND TURBINES**

4.3 Further to Section 4.2 of this By-law, no person shall erect a utility scale wind turbine in the General Resource (GR-1) Zone except in accordance with the following requirements:

- a) Minimum setback from all residences, except residences located on the same lot as the wind turbine, shall be ~~600 metres (1969 feet)~~ **1.0 kilometer (3280 feet)**. There is no setback requirement from residences located on the same lot;



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5. Part 4: “General Resource (GR-1) Zone” of the Land Use By-law is hereby amended by adding Subsection 4.5: “Requirements Relating to Wind Farms (2 Megawatts or More)” following Subsection 4.4: “Requirements Relating To Utility Scale Wind Turbines” and renumbering the subsequent subsections accordingly:

**REQUIREMENTS RELATING TO WIND FARMS (2 MEGAWATTS OR MORE)**

- 4.4 Further to Section 4.2 and Section 4.4, notwithstanding Section 4.4(a), of this By-law, no person shall erect a wind turbine in a wind farm with a total rated capacity of 2 megawatts or more in the General Resource (GR-1) Zone except in accordance with the following setback requirements shown in the table below:

Number of Wind Turbines in a Wind Farm with a Total Rated Capacity of 2 Megawatts or More	Proposed Setback
2 – 5 Wind Turbines	1 km
6– 10 Wind Turbines	1.2 km
11 – 25 Wind Turbines	1.5 km
26 or More Wind Turbines	Require a Noise Study to Determine Setbacks

6. Part 6: “Definitions” of the Land Use By-law is hereby amended by adding the following text in **bold**:

...

*Supporting structure* of a wind turbine includes all structures accessory to the turbine itself, including guy wires.

**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 farm. If capacity is not stated in the nacelle of the wind turbine, the capacity must be determined by recognized engineering practices.**

*Utility Wind Turbine* refers to a device for converting wind power to electricity, which has a name plate capacity of more than 100 Kilowatts (kW) and generates power primarily for sale to a third party and which may be developed either as a standalone machine or be grouped with others in a wind farm.

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