



Discussion Paper – Wind and Solar Energy Systems

Client Name: Rural Municipality of Blucher No. 343

Project Name: OCP and Zoning Bylaw Update

Prepared by: Bill Delainey

Issued: April 1, 2025

Previous Issue:

1 BACKGROUND

In response to growing interest in alternative energy sources, the RM Council is considering regulations that would enable residents and businesses to incorporate small-scale solar and wind energy systems on their properties. These changes would offer property owners the opportunity to explore renewable energy options that may reduce utility costs over time and enhance property value while contributing to a more diverse and resilient energy landscape within the RM.

The proposed regulations would permit the use of small-scale solar and wind facilities in all zoning districts, provided they are intended to support individual use and not generate electricity at a scale capable of powering large areas or providing significant contributions to the broader commercial power grid. Permitting these systems across all zoning districts allows residents and businesses to install energy solutions that fit their needs, as long as they meet development standards designed to protect safety and community aesthetics.

2 DEFINING SMALL-SCALE WIND AND SOLAR ENERGY SYSTEMS

According to the Saskatchewan Environmental Code, a private small-scale wind energy system is typically defined as a wind energy conversion system used primarily to generate electricity for use on the property where it is located, with a capacity limit often set around 100 kW or less.





The distinction between a private and a commercial wind energy system is generally based on the scale and purpose of the installation. Private systems are intended for individuals or on-site use, while commercial systems are intended for large-scale electricity production and distribution to the grid. Unlike large-scale commercial wind energy systems which are regulated by SaskPower, small-scale systems fall under the jurisdiction of the municipality.

As with wind energy systems, the Saskatchewan Environmental Code outlines the capacity limits and usage criteria that differentiate private small-scale solar energy systems from larger commercial installations. For small-scale systems, the capacity is typically up to 100 kW, intended primarily for personal or on-site electricity generation. Commercial systems exceed this capacity and are designed for large-scale electricity production and distribution to the grid.

The Technical Safety Authority of Saskatchewan (TSASK) is responsible for regulating small-scale solar installations and ensuring compliance with safety standards. The RM is responsible for authorizing the use of these systems through its zoning bylaws whereas TSASK is responsible for ensuring compliance with provincial safety standards for electrical, gas, plumbing, and other technical system. They issue permits, conduct inspections, and enforce regulations to ensure installations are safe and meet provincial codes.

There are three commonly used methods of mounting solar energy systems which include:

1. Roof-Mounted Systems which could include fixed or tilted solar panels or solar collection built into building materials such as solar shingles.
2. Ground Mounter Systems where the solar panels are mounted on an independent rack system; or
3. Pole-mounted Systems where panels are mounted on top or the side of a single pole, often with the ability to tilt and rotate to follow the sun.





3 POTENTIAL LAND USE CONFLICTS

As with any land use or activity, the possibility exists for the use of small-scale private wind and solar energy systems to impact the use and enjoyment of neighbouring properties. Some of the potential land use-related conflicts associated with wind energy systems may include:

1. Visual

A wind turbine can alter the visual character of an area due to the height of these systems relative to other structures on a property. Additionally, the blade movements can cast shadows, creating a noticeable flickering effect. Some ways to mitigate these impacts includes utilizing existing vegetation, topography, and other landscape features to screen the turbine from view, limiting lighting to what is required for safety, siting the turbine to reduce the potential flicker on nearby properties and implementing operational restrictions at certain times during the day where the affect is most prominent.

2. Noise

Small-scale wind turbines typically produce noise levels of around 35 to 45 decibels at a distance of 300 metres from the turbine. This is less than an air conditioner which generates up to 50 decibels or conversational speech which can generate between 40 to 60 decibels at this same distance. When placing a turbine, consideration should be made to maximize the distance from neighbouring residences.

3. Wildlife disruption

While the impact of a single small-scale wind turbine on wildlife is generally less significant than that of large-scale wind farms, there are still potential concerns including the impact of clearing an area for its construction which may displace habitat, the risk of bird collisions and the impacts of noise and vibration on sensitive species. Some of the common ways to reduce the risk of disruption are to employ systems with incorporated bird deterrents or which have lower blade speeds. Careful siting of the turbine in areas that are less sensitive to wildlife, avoiding areas with high bird and bat activity, critical habitats, and migratory routes is another way to mitigate potential impacts.

Some of the commonly perceived land use conflicts associated with the installation of small-scale solar energy systems in rural areas include:

1. Visual

At certain scales, the installation of solar collection systems can be perceived as a disruption to the rural landscape leading to concerns about aesthetics and the visual impact on scenic views. Considering the small scale of these systems and the land available in rural areas to provide a visual buffer reduces the potential impact.

2. Wildlife Habitat

Land clearing to install a ground or pole-mounted system could potentially disrupt local wildlife habitats. The placement of these independent systems should consider areas where the potential impact is reduced.

There is a common perception that certain forms of development may impact the value of properties near the development. There are no documented studies to suggest that the responsible placement and use of small-scale wind and solar energy systems create any statistically measurable effects on property values.



4 PROPOSED AMENDMENTS

4.1 Small-scale Wind Energy Systems

1. Add Small-scale Wind Energy Systems as a permitted form of development in every zoning district.
2. Add the following definition:

Small-scale Wind Energy System - A wind energy conversion system with a capacity of up to 100 kW, primarily used for generating electricity for personal or on-site use. These systems are typically installed on residential, agricultural, or small commercial properties and are subject to the standards defined by the Technical Safety Authority of Saskatchewan (TSASK).

3. Add the following development standards to Section 5 of the Zoning Bylaw.

Small-scale Wind Energy System

Notwithstanding other provisions of this Bylaw, a Small-scale Wind Energy System is subject to the following development standards:

1. The system shall not exceed a capacity of 100kW.
2. A turbine mounted on an independent structure shall be situated a minimum of 300 metres from a residence on an adjacent property and a minimum of 50 metres from any property line.
3. The maximum height of the tower, including the blades shall not exceed 50 metres measured from the ground elevation at the base of the tower.
4. The turbine should be situated to utilize natural vegetation and landscape features to minimize the visual impact on adjacent properties.
5. A turbine should be placed where the potential impact on local wildlife habitats is minimized. Areas along a common bird migratory route should be avoided.
6. A turbine should face away from populated areas and critical viewpoints to reduce the duration and potential intensity of shadow flicker.
7. Operators should employ automated control systems to detect and mitigate shadow flicker and pause turbine operation during times when shadow flicker is most likely to occur, such as early morning and late afternoon.
8. Turbine blades with anti-reflective coatings are encouraged to reduce glare and the intensity of shadows.
9. The applicant is responsible for obtaining the required permits from the Technical Safety Authority of Saskatchewan.

4.2 Small-scale Solar Energy Systems

1. Add Small-scale Solar Energy Systems as a permitted use in every zoning district.
2. Add the following definition:

Small-Scale Solar Energy System: A solar energy conversion system with a capacity of up to 100 kW, primarily used for generating electricity for personal or on-site use. These systems are typically installed on residential,



agricultural, or small commercial properties and are regulated by local municipalities and the Technical Safety Authority of Saskatchewan (TSASK).

3. Add the following development standards to Section 5 of the Zoning Bylaw.

Small-scale Solar Energy System

Notwithstanding other provisions of this Bylaw, a Small-scale Wind Energy System is subject to the following development standards:

1. The system shall not exceed a capacity of 100kW.
2. A solar collection system mounted on an independent rack or pole structure shall be situated a minimum of 50 metres from a residence on an adjacent property and a minimum of 10 metres from any property line.
3. The maximum height of a ground or pole-mounted system shall not exceed 3 metres measured from the ground elevation at the base of the rack or pole.
4. Ground or pole-mounted systems should be situated to utilize natural vegetation and landscape features to minimize the visual impact on adjacent properties.
5. Ground or pole-mounted systems should be placed where the potential impact on local wildlife habitats is minimized.
6. Consideration should be made to implement measures to minimize glare and reflection, such as using anti-reflective coatings on panels.
7. The applicant is responsible for obtaining the required permits from the Technical Safety Authority of Saskatchewan.