



CITY OF SAINT PAUL Christopher B. Coleman, Mayor

25 West Fourth Street Saint Paul, MN 55102 Telephone: 651-266-6700 Facsimile: 651-228-3220

Date:	November 27, 2017
То:	Neighborhood & Comprehensive Planning Committees
From:	Jake Reilly (651-266-6618/jake.reilly@ci.stpaul.mn.us)
Subject:	Alternative Energy Zoning: Background, Public Hearing and Recommendations

Introduction

On April 15, 2011, the Planning Commission initiated a zoning study to consider amendments to the zoning code pertaining to wind turbines that will address issues specific to wind turbines and conditions under which wind turbines might be permitted in various zoning districts.

In 2013, while staff was studying wind turbine regulation, the Minnesota Legislature passed a suite of laws that are driving the market for solar installations and enabling local government authority. Minnesota Statute 216B.1641 established the Xcel Energy Community Solar Garden Program. This program allows for large solar farms or gardens on structures and on large plots of land. The goal was to allow people who want to use solar energy as part of their energy consumption, but are unable to do so on their own. Saint Paul's zoning code does not accommodate solar installations as a principal use.

This memorandum summarizes the background of the study, the public hearing testimony, and proposed zoning code amendments.

Background - wind

Between 2002 and 2012 several applications for wind turbines were made to the Planning Commission, including for stand-alone "windmill" style horizontal axis wind turbines (HAWT) and for roof-top and standalone "egg beater" style vertical axis wind turbines (VAWT). One HAWT has been approved and is used for educational purposes at Macalester College. Four VAWT models were approved for a structure located in a B2 zoning district at 1010 North Dale.

The rationale for permitting wind energy conversion systems is to incentivize such systems by providing regulatory simplicity and predictability while protecting neighborhoods and deal with wind energy conversion systems as an accessory use, rather than as a primary use. Accessory uses are those that are "clearly incidental to, customarily found in connection with, and (except as provided in section 63.300) located on the same zoning lot as, the principal use to which it is related." This will regulate wind energy conversions systems the same way solar energy systems are regulated._Due to the nature of development and the market in Saint Paul, it is unlikely that a wind energy systems would be proposed as a primary use. Large wind (greater than 5,000 kW and generally a vertical turbine) might be considered as a primary use, but staff believes that users of wind turbines will seek to power a business or facility as an accessory use and not a primary use. If the market or patterns of development changes or interest arrives, wind energy conversion systems as a primary use may be considered.

In 2002 Macalester College applied for and received a Determination of Similar Use (DSU) for a freestanding, 10 kW, 102-foot high wind turbine located on the campus. Since then a number of people have approached the Department of Safety and Inspections (DSI) seeking information about freestanding and building-mounted wind turbine regulation in the city. On April 12, 2011 Capitol Lien and Title at 1010 North Dale applied for a DSU for a free-standing wind turbine and three building-mounted wind turbines. This application was approved subject to several conditions, including the completion of a noise study by a qualified acoustical engineer. On December 1, 2011, Metropolitan State University applied for a conditional use permit for a 20kW wind turbine on a freestanding pole 104 feet high. That application was initially approved by the Planning Commission, but upon appeal from the neighborhood was denied by the City Council in 2012.

This section of the memo outlines types of wind turbines; contains a survey of city and county ordinances regulating turbines or WECS; and makes recommendations for a Saint Paul ordinance related to WECS.

<u>Research</u>

Categories and design of wind turbines

There are two categories of wind turbines, according to the industry. The first is "large wind" which refers to turbines with a capacity of 5,000 kilowatts or more. "Small wind" is any turbine with a capacity of less than 5,000 kilowatts. The State of Minnesota Wind Siting Act (Chapter 203-S.F. No. 1076) uses the same categories in its wind turbine definitions.

Wind turbines also come in two different designs. <u>Horizontal-axis turbines</u> have blades that rotate perpendicular to the ground. These turbines must face into the wind in order to function and are similar to those seen in large wind farms, or locally at Macalester, in North Saint Paul, and in Maple Grove. <u>Vertical-axis turbines</u> have blades or rotors that rotate parallel to the ground and can capture turbulent wind, or wind in any direction. They have an egg beater-like appearance. Local examples include the three roof-top mounted, and one free-standing turbines at the Capitol Lien and Title company on Dale Street, on Como Avenue between Western and Virginia, and at the newly constructed Hy-Vee Grocery stores around the metro, including Oakdale, on the solar- and wind-powered electrical vehicle charging stations in their parking areas.

Like the Hy-Vee electrical vehicle charging station example, there are other hybrid wind/solar fixtures, usually light fixtures for use in parking lots or in public right of way with a solar power element and a wind power element. The solar element is a photovoltaic system and the wind element is a vertical axis wind turbine, or a small wind turbine.

Vertical-axis turbines in use in the US tend to generate less energy and fall into the "small wind" category. Commercial/industrial wind farm installations in the US have typically been horizontal-axis turbines. Generally speaking, urban installations tend to both have lower generation capacity and be vertical-axis turbines.

Practical applications

According to The Renewable Energy Hub web site (<u>https://www.renewableenergyhub.us/wind-turbines/how-much-does-wind-turbines-cost.html</u>), residential sites should:

- have a wind speed minimum of 5 meters per second (to test, you can install an anemometer, which many states supply);
- ensure there are no obstructions (e.g., other houses, trees) that could cause turbulence;
- make sure your building is not subject to any state, federal or even county restrictions, whether you are installing a roof mounted system or free-standing one;
- decide if you have enough land for foundations if you are installing a free-standing wind turbine; and

• check whether you need planning permission to install a wind turbine.

Wind turbines for residential use vary in power from 0.2kW to 25 kW and can be used as a supplemental energy source. According to data from Xcel Energy, the average residence in Minnesota uses about 9000kWh/year. The average cost for a roof-mounted residential turbine is about \$5,000, plus annual maintenance. Some wind turbines are able to store power in a battery.

System size	Approx. yearly system output*
.3kW (building-mounted)	669kWh
1kW (building-mounted)	1,750kWh
1.5kW (pole-mounted)	2,600kWh
2.5kW (pole-mounted)	4,400kWh
3.0kW (building-mounted)	6,500kWh
5kW (pole-mounted)	8,900kWh
10kW (pole-mounted)	21,500kWh
15kW (pole-mounted)	36,000kWh

*Assumes the average US wind speed of 5.6m/s for the sake of illustration. The actual system output is predicated upon a large range of factors. Larger, higher output turbines also tend to be mounted at greater heights, where wind speeds are higher, and turbines become more efficient.

Smaller turbines on residential structures are used to supplement electricity production from solar installations, particularly during winter months^a.

For a typical commercial district and commercial building in Saint Paul, similar systems could be applied, but with less effect, given commercial electricity consumption in Minnesota, which averages 80,400 kWh/month, according to Xcel Energy. Free-standing systems producing outputs like below would be horizontal systems, with a look similar to turbines in North Saint Paul, Maple Grove, and on windfarms throughout the country.

Freestanding system size	Approx. yearly system output*
1500 kW (1.5MW)	5,000,000kWh (5,000MWh)
2000 kW (2.0MW)	8,000,000kWh (8,000 MWh)
2500 kW (2.5MW)	11,000,000kWh (11,000 MWh)
3000 kW (3.0MW)	13,000,000kWh (13,0000 MWh)

*Averages from: http://www.windpowerengineering.com/turbine-selector-app/

Vertical-axis wind turbines are small wind generators (200 W - 10kW) can be used as stand-alone systems or as grid connected systems, and both can be paired with other energy conversion systems, such as photovoltaics. With a height from 6 to 32 feet small wind turbines can be placed on rooftops, on streets or in gardens, they have relatively little visual impact and are able to produce energy even from modest wind flows. Places like China, India and Italy have large markets, but small wind installations grow by about 10 percent each year^b.

Although they are installed lower to the ground than horizontal-axis devices, rooftop installations have advantages over ground-mounted turbines. According to Casini's article, if the height of the rooftop

^a Casini, Marco. "Small Vertical Axis Wind Turbines for Energy Efficiency." *Journal of Clean Energy Technologies*, vol. 4, no. 1, Jan. 2016, pp. 56-65. Accessed 8/18/2017: <u>http://www.jocet.org/vol4/254-H0020.pdf</u>

mounted turbine shaft is approximately 50 percent of the building height, energy generation will be maximized.

Potential land use impacts

Siting of wind turbines may have potential land use impacts. For large wind, consideration of the "fall" zone is important. However, wind installations of either variety are unlikely to impact the amount of traffic congestion in the public streets, or impede the normal and orderly development and improvement of the surrounding property. There is debate about the impact on the public health and safety of wind turbine products, which will be discussed later in this memo.

Other cities' regulations:

Staff reviewed nearly 20 ordinances from half a dozen states examining type of wind systems permitted, method of permitting; addressed zoning districts, heights, setbacks and other life/safety concerns, environmental concerns around humans and animals, including model ordinances proposed by sustainability experts in Minnesota and the US. Staff also spoke with regulators at the State and solar and wind-energy providers operating in Minnesota.

Height, setbacks, and blade clearance

Large wind systems generally require a conditional use permit, as in Minneapolis, and are not permitted in residential or office districts. The regulations usually restrict large wind installations to lots of one acre or greater and with no more than one turbine per acre. However, in Maple Grove and Eden Prairie, they are permitted as an accessory structure in all districts.

For large wind, setbacks are generally a 1.1 x height from any property lines (Cleveland, Lincoln, New York State Energy Research and Development Authority (NYSERDA)) or simply based on the tower height (Duluth, Madison, Plymouth), sometimes with a total height restriction (Duluth). The Distributed Wind Energy Association's model ordinance, suggests a 1.1 to 1.25 x height distance from property lines.

Height of large wind turbines generally depends on the lot size. Minneapolis restricts height to 100' tall on sites of five or more acres and 60' on sites of one to five acres. NYSERDA recommends that the height of the turbine from the ground to the top of the rotor at its highest position be 30', while in Plymouth, blade arcs "shall have a minimum of 30 feet of clearance *over* any accessory structure or tree." The American Wind Energy Association recommends that on a 1/2 to 1-acre lot, the height maximum should be no more than 150'.

Small wind turbines are generally permitted in all districts without a conditional use permit (Wisconsin). Lincoln, NE and Schaumburg, IL permit small wind turbines as a conditional or special use. Ground-mounted units are permitted as an accessory structure (Chicago, Duluth) and roof mounted ones are permitted in all districts (Henderson, NV and Minneapolis). In Minneapolis, one may not install a wind turbine on a residential structure with fewer than four stories.

For small wind, setbacks vary from being a simple 1:1 height ratio (Wisconsin) to 10' to 15' from the property line for smaller units (Oakland, Cleveland, Denver, AWEA). Chicago and Schaumberg, IL both require a 20' setback from all lot lines. Minneapolis sites wind turbines at least 10' from the wall of a structure.

Height restrictions generally refer to building-mounted small wind turbines but there are some restrictions for ground-mounted ones in residential districts. For ground-mounted turbines they must not be more than a certain height taller than the building on the property. This varies from 7' (Oakland)

to 75' (Denver). Minneapolis and Chicago, two urban cities surveyed from our region, require the turbine to be not greater than 15' above the rooftop or parapet, whichever is greater.

<u>Noise</u>

Noise regulations of large wind turbines vary from place to place. Cleveland limits sound to not more than 50 decibels measured from the nearest residential property line. This matches the MN Model ordinance and MN State noise rules (MN Rule 7030). NYSERDA suggests not more than 55 dB(A) at property line and AWEA 60 dB(A) at nearest building or not more than 5 dB(A) above ambient noise. Reno, Nevada and Schaumburg, IL limit wind turbine sound levels to 50 decibels over ambient noise, in residential districts and 60 decibels over ambient noise in other districts, according to "Planning for Wind Energy," a publication of the APA. The APA recommends using that standard. The output of a typical 2 kW turbine (the size to serve a single-family residence) is about 55 dBA at a distance of 50 feet. This is about the same level as a household air conditioning unit at 100 feet. In comparison, a passenger car at 65 mph at 25 ft is 77 dB, which is noted as being "annoyingly loud to some people," by the acoustic engineering firm IAC Acoustics. Decibels are additive which means a sound that is 50 dB (for example, standing 100 feet away from a large electrical transformer) is 1/4th as loud as that traffic example, and 80 dB is actually two times louder than 70 dB. Vertical-axis devices have very low sound generation, in comparison with horizontal-axis systems^c.

<u>Access</u>

Access to a wind turbine is typically limited by fencing and a lock and/or limiting climbing apparatus to not less than 8' above the ground, with the most common restriction being no climbing apparatus within 12' of the ground (NYSERDA, Minneapolis, Schaumberg, MN Model, Plymouth)

Animal impacts

Bat and bird impacts are not specifically mentioned in any codes currently established in the US. However, there have been some studies that suggest that at large wind sites anywhere from 1 to 3 birds are killed per tower per year. Bats potentially experience a kill rate of almost three times that. Wind turbines generally pose risks to individuals, not populations. Birds are more likely to be killed by other human infrastructure and utilities like vehicles, windows, communications towers, pollution and house cats, according to "Planning for Wind Energy." For most urban applications wind turbines are mounted lower than bird and bat migration paths. "Because of the relatively smaller blades and short tower heights, home-sized wind machines are considered too small and too dispersed to present a threat to birds. Researchers do not consider a study of home-sized wind systems worth funding." (focusonenergy.com) Small WECS have very limited wildlife impacts, according to the APA. The blade areas do not create as much of a hazard and there is typically plenty of maneuvering space around them. The number of birds killed annually by WECS is fewer than by housecats or glass windows and doors. In fact, in 2006 the Audubon Society issued a statement in support of well-located WECS. No research was found specifically about birds or bats and vertical wind turbines. An industry representative has stated that vertical wind turbines appear to be solid objects when spinning, which would cause birds and bats to fly around them, rather than try to go through them. There is no evidence to suggest that vertical wind turbines create enough disturbance in the wind to draw birds or bats in to them.

A review of current literature as of August 20, 2017 demonstrates that there is still little evidence to suggest that wind turbines create enough disturbance in the wind to draw birds or bats into them, particularly in urban areas.

[°] Ibid.

Other regulations

When addressed, the following criteria are found for all wind turbines: The wind turbines are not to interfere with electromagnetic communications; they are not to be used for advertising; the color or finish should blend in with the architecture or be screened or painted a subdued, non-reflective color. The American Wind Energy Association and Boston both refer to the systems minimizing glare and flickering shadows, which may be caused by the rotor spinning. Wind turbines must be removed when abandoned, which is defined differently based on the city, but most commonly after a 12-month period (Minneapolis, Maple Grove).

Hybrid (Wind/Solar) Fixtures

Hybrid (wind/solar) fixtures include light fixtures and mechanisms for powering electric vehicle charging stations are light fixtures for use in parking lots or in public right of way with a solar power element and a wind power element. The solar element is a photovoltaic system and the wind element is a small vertical axis wind turbine. The light fixtures are similar to cobra head lights and reflect downward, as required by the zoning code. The electric vehicle charging stations are similar to existing free-standing models used in city facilities, but with a similar solar/wind element to the light fixtures. The zoning code does not address these stations.

The zoning code as currently written does not preclude the use of a hybrid (wind/solar) light fixture. The hybrid light fixture is similar to standard light fixtures used in parking lots, and would be treated the same by the zoning code. The kinetic feature of the vertical-axis wind turbine is designed to minimize flicker impacts and the solar panel is similar to solar panels on other fixtures on light posts such as solar-powered wireless broadband internet systems in use around the country.

While zoning code does not specify lighting as a use, accessory or otherwise it does set standards in Section 63 and in the T districts.

Section 63.116 Exterior Lighting of the zoning code addresses standards for exterior lighting. It requires that lighting be shielded to reduce glare and arranged as to reflect lights away from all adjacent residential districts in such a way as not to exceed 3 footcandles measured at the residential district boundary. Lighting illuminating the exterior of a building must also be placed and shielded to avoid interference with the vision of people on highways or adjacent property.

Section 63.318 sets the standard for lighting in parking facilities. It requires that parking facilities be illuminated to a level to allow safe, secure access to the parking facility and within it, and states that all lighting shall conform to Section 63.116.

Additionally, the Traditional Neighborhood district design standards in Section 66.343 state that pedestrian-scale lighting shall be provided in parking areas but that poles shall not be more than 25 feet in eight in parking lots and 16 feet in height along interior sidewalks and walkways.

Chapter 63, Article 2 of the zoning code addresses other parking requirements, and allows for reductions in parking minimums for provision of energy efficient vehicles.

Background - solar

In 2011 Saint Paul amended the zoning code to better accommodate solar installations.

Since then, state law enabling the creation of Community Solar Gardens was passed in 2013, and became effective in 2015. Community Solar Gardens are centrally-located solar photovoltaic (PV)

systems that provide electricity to participating subscribers. Xcel Energy customers can participate in projects offered by private developers. Because Minnesota state statutes leave most solar development regulation to local governments, it is important for Saint Paul to have development regulations that are "solar ready," which means ordinances will address all the types of solar land uses the community is likely to see. Based on public hearing testimony, outlined in the next section, *solar energy generation facility, community* is proposed as a use, with applicable standards. This amendment is based on accepted practice as described in a model ordinance produced by the Great Plains Institute and funded by the U.S. Department of Energy for the State of Minnesota^d.

Public Hearing

On September 22, 2017, the Planning Commission released city-wide recommendations to amend the zoning code regarding wind energy conversion systems for public review and held a public hearing on Nov. 3, 2017. The recommendations were intended to address where and how wind energy systems would be regulated throughout Saint Paul. Comments were accepted through November 6, 2017 and are attached.

Staff received six written comments during the period of public review, and one person spoke at the public hearing. All of the comments were supportive of the effort to provide use of alternative energy systems, including wind, and six of the comments requested the City to consider solar as a principal use. The seventh comment addressed solar access, particularly in areas where increased density is expected proximate to lower density residential structures. Solar access protection will be well addressed in the pending update of the Saint Paul Comprehensive Plan.

Staff Recommendations

Staff recommends that the Comprehensive Planning Committee forward this report and the following amendments to Chapters 63, 65 and 66 of the Zoning Code in order to accommodate hybrid solar/wind-powered light fixtures, wind energy conversion systems, and *solar energy generation facility, community* to accommodate solar gardens as a principal use.

NOTE: Existing language to be deleted is shown by strikeout. New language to be added is shown by underlining.

Sec. 63.116. Exterior lighting.

(d) Hybrid (wind/solar) light fixtures will be placed so as to minimize flicker impacts and shall not exceed 25 feet in height. They shall be set back from other principal structures by at least one (1) times the height of the fixture.

Sec. 65.322. Solar energy generation facility, community.

A solar electric (photovoltaic) facility that provides electric power for off-site uses on the distribution grid, consistent with Minn. Statutes 216B.1641.

Standards and conditions:

(a) An interconnection agreement must be completed with the electric utility in whose service territory the system is <u>located.</u>

^d <u>http://www.growsolar.org/wp-content/uploads/2015/04/Minnesota-Toolkit.pdf</u> (accessed November 2017)

- (b) Power and communication lines running between banks of solar panels and to nearby electric substations or interconnections with buildings shall be buried underground.
- (c) Community solar energy generation facilities shall be subject to height and setback standards that apply to buildings in the district, provided that in residential districts the height standards for accessory solar energy systems in section 65.921 shall apply.
- (d) A ground-mount (freestanding) community solar energy generation facility shall require a conditional use permit, the application for which shall include a site plan including landscaping and elevations.
- (e) For a facility within five hundred (500) feet of an airport or within the A or B safety zones of an airport, the applicant must complete and provide the results of the Solar Glare Hazard Analysis Tool for the Airport Traffic Control Tower cab and final approach paths, consistent with the Interim Policy, FAA Review of Solar Energy Projects on Federally Obligated Airports, or most recent version adopted by the FAA.
- (f) A decommissioning plan shall be required to ensure that facilities are properly removed after their useful life. Decommissioning of solar panels must occur in the event they are not in use for twelve (12) consecutive months. The plan shall include provisions for removal of all structures and foundations, restoration of soil and vegetation and a plan ensuring financial resources will be available to fully decommission the site.

Sec. <u>65.323.</u> 65.322. Utility or public service building.

• • •

Sec. 65.925. Wind energy conversion system.

Any device such as a windmill or wind turbine that converts wind energy to electrical energy, and associated facilities including the support structure of the system.

Standards and conditions:

(a) A building-mounted wind energy conversion system shall be subject to the maximum building height specified for the district or a maximum of fifteen (15) feet above the height of the building to which it is attached, whichever is greater. In residential districts the system shall be set back a minimum of ten (10) feet from all exterior walls of the building to which it is attached.

(b) In residential, traditional neighborhood and business districts, a conditional use permit is required for a freestanding wind energy conversion system with a capacity of more than two (2) kilowatts.

(c) In residential, traditional neighborhood and business districts, a freestanding wind energy conversion system with a capacity of more than two (2) kilowatts shall be subject to the following standards and conditions:

(1) Freestanding systems shall not exceed one hundred twenty-five (125) feet in height.

(2) The system shall not be located in a required front or side yard and shall be set back one and one tenth (1.1) times the height of the system from residential buildings.

(3) In residential and traditional neighborhood districts, the system shall be on institutional use property at least one (1) acre in area. In business districts, the zoning lot on which the system is located shall be in an area of contiguous business or industrial zoning at least five (5) acres in area. A maximum of one (1) wind energy conversion system per acre of lot area shall be allowed.

(d) In industrial districts, a freestanding wind energy conversion system shall not exceed one hundred fifty (150) feet in height, shall not be located in a required front or side yard, and shall be set back one and one tenth (1.1) times the height of the system from residential buildings.

(e) Wind energy conversion systems shall conform to the uniform building code, electric code, Minnesota Rules Section 7030 governing noise, and Chapter 293, Noise Regulations. System noise shall not exceed 50 dB(A) at the nearest residential property line. For property within a locally designated heritage preservation site or district, the system shall be subject to review and approval of the heritage preservation commission.

(f) Freestanding systems shall be mounted on a monopole type tower with a non-reflective, subdued finish that does not require guyed wires or any other means to support the tower.

(g) Blade arcs created by a freestanding wind energy conversion system shall have a minimum of thirty (30) feet of clearance over any building or tree within a two hundred (200) foot radius.

(h) Wind energy facilities shall be sited in a manner that minimizes shadowing or flicker impacts. The applicant has the burden of proving that this effect does not have significant adverse impact on adjacent uses.

(i) Electrical equipment shall be housed within an existing building whenever possible. If a new equipment building is necessary, it shall be permitted and regulated as an accessory building.

(j) Wind energy conversion systems that are no longer used shall be removed within one (1) year of nonuse.

(k) An applicant for a building permit for a wind energy conversion system shall provide written certification to the building official from a licensed structural engineer that:

(1) For building-mounted systems, the structure has the structural integrity to carry the weight and wind loads; and

(2) The system is designed not to cause electrical, radio frequency, television and other communication signal interference.

(1) If the applicant plans to connect the system to the electricity grid, written evidence that the electric utility service provider serving the property has been informed of the applicant's intent to install a wind energy conversion system shall also be submitted to the building official.

Sec. 66.221. Principal uses.

Table 66.221. Principal Uses in Residential Districts

Use	RL	R1- R4	RT1	RT2	RM1	RM2	RM3	Definition (d) Standards (s)
Public Services and Utilities								
Antenna, cellular telephone	P/C	(d), (s)						
Municipal building or use	Р	Р	Р	Р	Р	Р	Р	(d), (s)
Solar energy generation facility, community	<u>P/C</u>	<u>(d), (s)</u>						

Use	RL	R1- R4	RT1	RT2	RM1	RM2	RM3	Definition (d) Standards (s)
Utility or public service building	C	C	C	C	C	C	C	(d), (s)
Yard waste site, municipal	C	C	C	C	C	C	C	(d), (s)

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.221, principal uses in residential districts:

(d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.

(s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards.

Sec. 66.321. Principal uses.

• • •

Table 66.321. Principal Uses in Traditional Neighborhood Districts

Use	T1	T2	Т3	T4	Definition (d) Standards (s)
Public Services and Utilities					
Antenna, cellular telephone	P/C	P/C	P/C	P/C	(d), (s)
Municipal building or use	Р	Р	Р	Р	(s)
Solar energy generation facility, community	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>(d), (s)</u>
Utility or public service building	C	C	C	C	(d), (s)

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.321, principal uses in traditional neighborhood districts:

(d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.

(s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards.

Sec. 66.421. Principal uses.

. . .

Table 66.421. Principal Uses in Business Districts

Use	OS	B1	BC	B2	B3	B4	B5	Definition (d) Standards (s)
Public Services and Utilities								
Antenna, cellular telephone	P/C	(d), (s)						
Electric transformer or gas regulator substation		C	C	C	Р	Р	Р	(s)
Municipal building or use	Р	Р	Р	Р	Р	Р	Р	(s)
Public utility heating or cooling plant							Р	

Use	OS	B1	BC	B2	B3	B4	B5	Definition (d) Standards (s)
Solar energy generation facility, community	<u>P/C</u>	<u>(d), (s)</u>						
Utility or public service building	C	Р	Р	Р	Р	Р	Р	(d), (s)

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.421, principal uses in business districts:

- (d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.
- (s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards.

Sec. 66.521. Principal uses.

Table 66.521. Principal Uses in Industrial Districts

Use	IT	I 1	I2	I3	Definition (d) Standards (s)
Public Services and Utilities					
Sewage treatment plant			Р	Р	
Solar energy generation facility, community	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>(d), (s)</u>
Utility or public service building or yard	Р	Р	Р	Р	(d)

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.421, principal uses in industrial districts:

(d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.

(s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards

Sec. 66.921. Ford district use table.

Table 66.921, Ford district uses, lists all permitted and conditional uses in the F1-F6 Ford districts, and notes applicable development standards and conditions.

Table 66.921. Ford District Uses

Use	F1	F2	F3	F4	F5	F6	Definition (d) Standards (s)
Public Services and Utilities							
Antenna, cellular telephone	P/C	P/C	P/C	P/C	P/C	P/C	(d), (s)
Electric transformer or gas regulator substation			Р	Р	Р	Р	(s)
Municipal building or use		Р	Р	Р	Р	Р	(s)
Public utility heating or cooling plant		Р	Р	Р	Р	Р	
Solar energy generation facility, community		P/C	P/C	P/C	P/C	<u>P/C</u>	<u>(d), (s)</u>
Utility or public service building	Р	Р	Р	Р	Р	Р	(d), (s)

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.921, Ford district uses:

- (d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.
- (s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards.

city of saint paul planning commission resolution file number _____ date _____

SUSTAINABLE ENERGY ZONING TEXT AMENDMENTS

WHEREAS, the Saint Paul Zoning Code, found in chapters 60 through 69 of the Saint Legislative Code, is established to promote and protect the public health, safety, morals aesthetics, economic viability and general welfare of the community; and

WHEREAS, Zoning Code § 61.801 calls for the periodic review of the code to reflect current city policies, and provides that amendments to the Zoning Code may be initiated by the Planning Commission; and

WHEREAS, In April 2011, the Planning Commission initiated a study to consider amendments to the Zoning Code regarding wind energy conversion systems; and

WHEREAS, in 2013, the Minnesota Legislature passed a suite of laws associated with community solar gardens, discussion of which was included in the study; and

WHEREAS, on November 3, 2017, the Saint Paul Planning Commission held a duly noticed public hearing on proposed zoning text amendments regarding sustainable power zoning code amendments; and

WHEREAS, the Neighborhood Planning Committee, on November 28, 2017, forwarded its recommendations to the Planning Commission;

NOW, THEREFORE, BE IT RESOLVED, under provisions of Minnesota Statutes §462.367 and Legislative Code §61.801, that the Planning Commission hereby recommends to the Mayor and City Council the following amendments to Chapters 63, 65 and 66 of the Saint Paul Zoning Code pertaining to hybrid solar/wind-powered light fixtures, wind energy conversion systems and community solar installations, as set forth on page 2 of this resolution; and

BE IT ALSO RESOLVED, that the Planning Commission directs the Planning Administrator to forward the following amendments, along with the November 28, 2017, memorandum from the Neighborhood Planning Committee containing their recommendations and rationale for the recommended text amendments, to the Mayor and City Council for their review and adoption.

moved by	
seconded by	
in favor	
against	

Planning Commission Resolution Page 2 of 6

Sec. 63.116. Exterior lighting.

•••

(d) Hybrid (wind/solar) light fixtures will be placed so as to minimize flicker impacts and shall not exceed 25 feet in height. They shall be set back from other principal structures by at least one (1) times the height of the fixture.

•••

Sec. 65.322. Solar energy generation facility, community.

<u>A solar electric (photovoltaic) facility that provides electric power for off-site uses on the distribution grid, consistent with Minn. Statutes 216B.1641.</u>

Standards and conditions:

- (a) An interconnection agreement must be completed with the electric utility in whose service territory the system is located.
- (b) Power and communication lines running between banks of solar panels and to nearby electric substations or interconnections with buildings shall be buried underground.
- (c) Community solar energy generation facilities shall be subject to height and setback standards that apply to buildings in the district, provided that in residential districts the height standards for accessory solar energy systems in section 65.921 shall apply.
- (d) A ground-mount (freestanding) community solar energy generation facility shall require a conditional use permit, the application for which shall include a site plan including landscaping and elevations.
- (e) For a facility within five hundred (500) feet of an airport or within the A or B safety zones of an airport, the applicant must complete and provide the results of the Solar Glare Hazard Analysis Tool for the Airport Traffic Control Tower cab and final approach paths, consistent with the Interim Policy, FAA Review of Solar Energy Projects on Federally Obligated Airports, or most recent version adopted by the FAA.
- (f) A decommissioning plan shall be required to ensure that facilities are properly removed after their useful life. Decommissioning of solar panels must occur in the event they are not in use for twelve (12) consecutive months. The plan shall include provisions for removal of all structures and foundations, restoration of soil and vegetation and a plan ensuring financial resources will be available to fully decommission the site.

Sec. 65.323. 65.322. Utility or public service building.

•••

Sec. 65.925. Wind energy conversion system.

Any device such as a windmill or wind turbine that converts wind energy to electrical energy, and associated facilities including the support structure of the system.

Standards and conditions:

(a) A building-mounted wind energy conversion system shall be subject to the maximum building height specified for the district or a maximum of fifteen (15) feet above the height of the building to which it is attached, whichever is greater. In residential districts,

Planning Commission Resolution

Page 3 of 6

the system shall be set back a minimum of ten (10) feet from all exterior walls of the building to which it is attached.

(b) In residential, traditional neighborhood and business districts, a conditional use permit is required for a freestanding wind energy conversion system with a capacity of more than two (2) kilowatts (kW).

(c) In residential, traditional neighborhood and business districts, a freestanding wind energy conversion system with a capacity of more than two (2) kilowatt shall be subject to the following standards and conditions:

(1) Freestanding systems shall not exceed one hundred (125) feet in height.

(2) The system shall not be located in a required front or side yard and shall be set back one and one tenth (1.1) times the height of the system from residential buildings.

(3) In residential and traditional neighborhood districts, the freestanding wind energy conversion system shall be on institutional use property at least one (1) acre in area. In business districts, the zoning lot on which the freestanding system is located shall be in an area of contiguous business or industrial zoning at least five (5) acres in area. A maximum of one (1) wind energy conversion system per acre of lot area shall be allowed.

(d) In industrial districts, a freestanding wind energy conversion system shall not exceed one hundred fifty (150) feet in height, shall not be located in a required front or side yard, and shall be set back one and one tenth (1.1) times the height of the system from residential buildings.

(e) Wind energy conversion systems shall conform to the uniform building code, electric code, Minnesota Rules Section 7030 governing noise, and Chapter 293, Noise Regulations. System noise shall not exceed 50 dB(A) at the nearest residential property line. For property within a locally designated heritage preservation site or district, the system shall be subject to review and approval of the heritage preservation commission.

(f) Freestanding systems shall be mounted on a monopole type tower with a nonreflective, subdued finish that does not require guyed wires or any other means to support the tower.

(g) Blade arcs created by the WECS shall have a minimum of thirty (30) feet of clearance over any structure or tree within a two hundred (200) foot radius.

(h) Wind energy facilities shall be sited in a manner that minimizes shadowing or flicker impacts. The applicant has the burden of proving that this effect does not have significant adverse impact on adjacent uses.

(i) Electrical equipment shall be housed within an existing structure whenever possible. If a new equipment building is necessary, it shall be permitted and regulated as an accessory building.

(i) Wind energy conversion systems that are no longer used shall be removed within one (1) year of nonuse.

(k) An applicant for a building permit for a wind energy conversion system shall provide written certification to the building official from a licensed structural engineer that:

(1) For building-mounted systems, the structure has the structural integrity to carry the weight and wind loads;

(2) The system is designed not to cause electrical, radio frequency, television and other communication signal interference.

(I) If the applicant plans to connect the system to the electricity grid, written evidence that the electric utility service provider serving the property has been informed of the applicant's intent to install a wind energy conversion system shall also be submitted to the building official.

Sec. 66.221. Principal uses.

Table 66.221. Principal Uses in Residential Districts

Use	RL	R1- R4	RT1	RT2	RM1	RM2	RM3	Definition (d) Standards (s)
Public Services and Utilities								
Antenna, cellular telephone	P/C	(d), (s)						
Municipal building or use	P	P	Р	P	Р	P	P	(d), (s)
Solar energy generation facility, community	<u>P/C</u>	<u>(d), (s)</u>						
Utility or public service building	C	C	С	С	С	С	С	(d), (s)
Yard waste site, municipal	C	C	С	С	С	С	С	(d), (s)

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.221, principal uses in residential districts:

- (d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.
- (s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards.

Sec. 66.321. Principal uses.

• • •

. . .

Table 66.321. Principal Uses in Traditional Neighborhood Districts

Use	T1	T2	Т3	T4	Definition (d) Standards (s)
Public Services and Utilities					
Antenna, cellular telephone	P/C	P/C	P/C	P/C	(d), (s)
Municipal building or use	P	P	P	P	(s)

Planning Commission Resolution Page 5 of 6

Use	Т1	T2	Т3	T4	Definition (d) Standards (s)
Solar energy generation facility, community	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>(d), (s)</u>
Utility or public service building	С	С	С	С	(d), (s)

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.321, principal uses in traditional neighborhood districts:

- (d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.
- (s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards.

Sec. 66.421. Principal uses.

Table 66.421. Principal Uses in Business Districts

Use	OS	B1	BC	B2	В3	B4	B5	Definition (d) Standards (s)
Public Services and Utilities								
Antenna, cellular telephone	P/C	(d), (s)						
Electric transformer or gas regulator substation		С	С	С	Р	Р	Р	(s)
Municipal building or use	P	Р	Р	P	Р	P	Р	(s)
Public utility heating or cooling plant							Р	
Solar energy generation facility, community	<u>P/C</u>	<u>(d), (s)</u>						
Utility or public service building	С	Р	Р	P	Р	Р	Р	(d), (s)

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.421, principal uses in business districts:

- (d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.
- (s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards.

Sec. 66.521. Principal uses.

Table 66.521. Principal Uses in Industrial Districts

Use	П	11	12	13	Definition (d) Standards (s)
Public Services and Utilities					

Use	IT	11	12	13	Definition (d) Standards (s)
Public Services and Utilities					
Sewage treatment plant			Р	Р	
Solar energy generation facility, community	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>(d), (s)</u>
Utility or public service building or yard	Р	Р	Р	Р	(d)

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.421, principal uses in industrial districts:

- (d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.
- (s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards

Sec. 66.921. Ford district use table.

Table 66.921, Ford district uses, lists all permitted and conditional uses in the F1-F6 Ford districts, and notes applicable development standards and conditions.

Use	F1	F2	F3	F4	F5	F6	Definition (d) Standards (s)
Public Services and Utilities		-					
Antenna, cellular telephone	P/C	P/C	P/C	P/C	P/C	P/C	(d), (s)
Electric transformer or gas regulator substation			Р	Р	Р	Р	(S)
Municipal building or use		Р	Р	Р	Ρ	Р	(s)
Public utility heating or cooling plant		P	Р	Р	Р	Р	
Solar energy generation facility, community		<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>P/C</u>	<u>(d), (s)</u>
Utility or public service building	P	P	P	Р	P	Р	(d), (s)

|--|

P – Permitted use C – Conditional use requiring a conditional use permit

Notes to table 66.921, Ford district uses:

- (d) Definition for the use in Chapter 65, Land Use Definitions and Development Standards.
- (s) Standards and conditions for the use in Chapter 65, Land Use Definitions and Development Standards.

From:	Lorraine Delehanty <delelor@gmail.com></delelor@gmail.com>
Sent:	Friday, November 03, 2017 3:55 PM
То:	Reilly, Jake (CI-StPaul)
Subject:	Re: renewable energy comment

Jake,

مه بهر

This is perhaps a little more focused on the question.

I urge St. Paul Planning and Economic Development to create a city ordinance addressing solar as a principal use.

The reasons for the urgency of this ordinance are the following:

As a concerned citizen of St. Paul, I believe that it is common sense to decarbonize our energy system. The moment is now to convert to clean energy. Our capital city can be an example to other cities. It will give hope as we transition to wind and solar energy. I urgently encourage you to act to make this transition to clean energy possible. At the national level, the policy makers are not in this conversion, so at the local level we must take the power to do what is right. The St. Paul Climate Action Group has laid a fine groundwork for going to the next step of solar gardens and wind turbines.

As a person of faith, I believe it is good social responsibility and stewardship to move toward carbon neutrality. I believe it is wise to use less energy as well as converting to renewables. I also believe that MN is a leader. Power is at the city level in more ways than one. Our cities have an opportunity to be stronger than ever. As the cochair of a local Care for Creation group (St. Thomas More Catholic Community) and a concerned citizen, I encourage your group to create this city ordinance for solar as a principal use for the citizens of St. Paul Thank you for all that you do

Thank you for all that you do.

Lorraine Delehanty

On Nov 2, 2017, at 6:45 AM, "Reilly, Jake (CI-StPaul)" <jake.reilly@ci.stpaul.mn.us> wrote:

Thank you! I will be sure to provide this to the Planning Commission.

-Jake

<image007.jpg>Jacob Reilly

Senior City Planner Planning and Economic Development 25 W 4th Street, Suite 1400 Saint Paul, MN 55102 P: 651-266-6618 F: 651-266-6549 jake.reilly@ci.stpaul.mn.us <image003.png><image004.png><image005.png><image006.jpg>

Making Saint Paul the Most Livable City in America

Please note: I am out of the office on alternate Fridays, with limited ability to access email and voicemail. I will return your message as soon as I am able.

1

From: Lorraine Delehanty [mailto:delelor@gmail.com] Sent: Thursday, November 02, 2017 6:39 AM To: Reilly, Jake (CI-StPaul) <<u>jake.reilly@ci.stpaul.mn.us</u>> Subject: renewable energy comment

Sent from my iPad

Begin forwarded message:

On 11/1/2017 3:45 PM, Lorraine Delehanty wrote:

In addition, if you or the committee or the multi-church sustainability initiative you spoke about care to submit comments before the close of the public hearing, you/they may do so via my email or mailing address (below) before 4:30 p.m. on Monday, November 6th, when the hearing will be closed

As a concerned citizen of St. Paul, I believe that it is common sense to decarbonize our energy system. The moment is now to convert to clean energy. Our capital city can be an example to other cities. It will give hope as it transitions to wind and solar energy. I urgently encourage you to act to make this transition to clean energy. At the national level, the policy makers are not in this conversion, so at the local level we must take the power to do what is right. The St. Paul Climate Action Group has laid a fine groundwork for going to the next step of solar gardens and wind turbines. As a person of faith, I believe it is good social responsibility and stewardship to move toward carbon neutrality. I believe it is wise to use less energy as well as converting to renewables. I also believe that MN is a leader. We need to act big and think big. Power is at the city level in more ways than one. Our cities have an opportunity to be stronger than ever. As the chair of a local Care for Creation group (St. Thomas More Catholic Community), I would like climate change to be a personal concern for folks who will support the city's efforts at decarbonization.

Lorraine Delehanty

From:	Mike and Benita <warns@pclink.com></warns@pclink.com>
Sent:	Tuesday, October 24, 2017 11:54 PM
То:	Reilly, Jake (CI-StPaul)
Subject:	Sustainable Power/Wind/Solar Zoning Issues

Please share these comments with the members of the Planning Commission during the public hearing on this subject.

This zoning language appears to be based on common practices in other municipalities and is logical. I believe that our power systems should be decentralized and that homes should use a combination of several power sources that include renewable sources. These zoning amendments support the ability of property owners to procure and use renewable energy sources to supply power needs to their buildings.

There is one thing that I believe must be addressed, and that is guaranteeing access to adequate sunlight for existing property owners. When a new development is proposed that will be substantially larger than what is being replaced, the adjacent property owners should be guaranteed that the new development will not cast new shadows or block sunlight to their properties. To prove this, a shadow analysis must be required to be submitted along with the rest of the building plans and considered in the site plan analysis. In the event that the proposed new building would cast new shadows on any adjacent property, the developer must agree to compensate the property owner for lost access to sunlight or alter the plans to remove the shadows. That compensation could include such items as replacement of permanent landscape plantings that require sunlight or payments to cover loss of use of a solar energy system. No developer should be allowed to build a structure that will prevent an adjacent property owner from future installation of a solar energy system.

Planning for solar energy in St. Paul, especially smaller residential systems, must include guaranteed access to sufficient air space to capture the sunlight needed to operate the systems.

Benita Warns 1440 Lafond Avenue St. Paul, MN 55104 651-641-1037 warns@pclink.com

From: Sent: To: Subject: Judith Oberhauser <jeoriveroberh@icloud.com> Friday, November 03, 2017 6:52 PM Reilly, Jake (CI-StPaul) Going solar

Yes, I do urge our council to make St. Paul a true city of light. We need to go solar! This is a prophetic stance which we need to insure happens! Thanks. Judith

Sent from my iPad

From: Sent: To: Subject:

6

JUDY M WOLFF <jzwolff@msn.com> Saturday, November 04, 2017 7:56 AM Reilly, Jake (CI-StPaul) Carbon Footprint

I am a 49 resident of St. Paul. It has been a wonderful experience and I plan on living here for the rest of my life. However, as a concerned citizen of St. Paul, I believe that it is common sense to decarbonize our energy system. The moment is now to convert to clean energy. Our capital city can be an example to other cities.

Thank you for the work that you do.

Judy Wolff 1549 Fairmount Avenue St. Paul 55105

From:	Bernadette Welter <bwelter@usfamily.net></bwelter@usfamily.net>
Sent:	Sunday, November 05, 2017 9:29 PM
То:	Reilly, Jake (CI-StPaul)
Subject:	Public comment

I urge the St. Paul Planning and Economic Development to create a city ordinance addressing solar as a principal use. Thank you for considering this request.

Bernadette Welter

From: Sent: To: Subject:

9 17

William Delehanty <delebill@yahoo.com> Monday, November 06, 2017 4:29 PM Reilly, Jake (CI-StPaul) Solar as a Principal Use

I write in support of a St. Paul city ordinance to classify solar energy as a principal use. There is an urgent national need to convert to clean, non-polluting energy production. Solar energy can do that. We in St. Paul can make sure that the groundwork, literally, is established here for solar energy to be produced for our use. I have heard about the use of solar gardens and I hope that we can make it feasible for such to be developed here in St. Paul.

Thank you,

William Delehanty

525 Lexington Parkway S

St. Paul

