DEPARTMENT OF PLANNING &
ECONOMIC DEVELOPMENT
Cecile Bedor, Director

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: September 7, 2011

To: Planning Commission

From: Neighborhood Planning Committee

Subject: Solar Energy Systems Zoning Text Amendments - Public Hearing Testimony and Recommendations

Background

In 2008 the cities of St. Paul and Minneapolis received a U.S. Dept. of Energy Solar America Cities grant to identify strategies that will result in solar-friendly policies, practices and regulations. Policy LU-3.19 in the Saint Paul Comprehensive Plan calls for study of "tools, techniques, and regulations to facilitate increased usage of solar energy systems, either as standalone systems or as supplements to conventional energy sources." § 60.103(k) of the Zoning Code states that a purpose of the Zoning Code is "to promote the conservation of energy and the utilization of renewable energy resources."

The Zoning Code treats solar energy systems as a permitted accessory use in all zoning districts under the definition of *accessory use* in § 65.910. The code does not separately list solar energy systems as an accessory use, just as it does not separately list air conditioners, ventilation equipment, and similar equipment. A solar energy system mounted on a building is subject to the dimensional standards that apply to the building. A freestanding solar energy system is subject to the dimensional and locational standards that apply to an accessory structure.

This current practice in Saint Paul generally appears to be a good balance between providing for solar energy systems and adequately regulating them. It does not seem to be a significant barrier to use of solar energy systems. Neither is there evidence that solar energy systems installed under existing regulations are inconsistent with the intent and purpose of the Zoning Code to promote and protect the public health, safety and general welfare.

Before permits are issued for installation of a solar energy system in Saint Paul, the plans and construction drawings are reviewed by Department of Safety and Inspections plan review and zoning staff and the structural engineer to ensure code compliance. Required documentation includes a building permit application, engineering plans showing the framing system and how it is attached to a building, location on a building, elevations, and a site plan if it is located in a yard rather than on a building. A separate electrical permit is required for photovoltaic systems, and a mechanical permit is required for thermal systems.

Last spring we reviewed zoning regulations pertaining to solar energy systems in the Saint Paul code, a Minnesota model ordinance, Minneapolis and other cities, and recommended amendments that may improve or clarify the Saint Paul code.

On July 8, 2011, the planning commission held a public hearing on draft solar energy systems zoning text amendments that clarify and add some detail to the regulations that apply to solar energy systems while maintaining the current general approach. Three people testified at the public hearing and also submitted written comments. In addition, written comments were received from two other interested parties. This memo summarizes the public hearing testimony, reviews research and analysis on the issues raised, and presents comments and recommendations in response to the testimony for the commission to consider as it makes its recommendations on the proposed solar energy systems zoning code text amendments.

Public hearing testimony issues, analysis, and recommendations

Public hearing testimony on the draft solar energy systems zoning code text amendments focused on three issues: visual impact, height, and setbacks of solar installations.

1. Visual impacts

Summary

The public hearing draft amendments delete the word *mechanical* in § 63.110(e), and further amends § 63.110(e) by changing the word *visibility* to *visual impact* as follows:

> **Sec. 63.110. Building design standards.**
>
> (e) The ~~visibility~~ visual impact of rooftop ~~mechanical~~ equipment shall be reduced through such means as location, screening, or integration into the roof design. Screening shall be of durable, permanent materials that are compatible with the primary building materials. Exterior mechanical equipment such as ductwork shall not be located on primary building facades.

The amendment would apply this general design standard for rooftop equipment to solar energy systems that are not mechanical systems. It would also help make it clear that § 63.110(e) doesn't require screening to reduce *visibility* of rooftop equipment, but rather requires reducing the *visual impact*, which can be done through such things as location and integration into the roof design as well as by screening.

Testimony

Ralph Jacobson, owner of Innovative Power Systems and president of Minnesota Solar Energy Industries Association, noted that solar panels are not intrinsically unsightly, what people think of as nice looking can be fairly subjective, and for solar panels it's more a matter of how they are deployed.

Michael Russelle, 1480 Chelmsford, questioned how and why screening would be applied to reduce the visual impact of solar panels on a residential building.

Terry Brueck, 2279 Summit, said § 63.110(e) should allow for rooftop solar arrays to be south facing, clarifying that "south facing collectors are allowed in the roof design, including south facing panels at right angles against the roofline."

James Darabi, Solar Farm, LLC, St. Paul, expressed concern that electrical conduits and insulated solar fluid pipes (in the case of solar hot water) should be allowed on primary building facades, that it can sometimes be difficult and very expensive to put them elsewhere, and they can look much like rain gutter downspouts.

Daniel Williams, owner of Powerfully Green, a solar energy system installer, said he assumes that the language in § 63.110(e) about "mechanical equipment such as ductwork" on primary building facades does not apply to solar plumbing and solar electric runs, which are similar to Xcel electric runs and downspouts commonly on primary building facades.

Analysis and response

The draft amendment to § 63.110(e) addresses how solar panels are deployed, with a fair amount of flexibility. It does not require screening of rooftop solar panels, but rather requires reducing the *visual impact* of rooftop solar panels, which can be done through such things as location and integration into the roof design as well as by screening.

Most cities do not require screening of rooftop solar installations. The MN Model Sustainable Development Ordinance recommends that active solar systems "shall be designed to blend into the architecture of the building or be screened from routine view from public rights-of way other than alleys." An apartment building with a flat roof may have a parapet that screens a rooftop solar energy system and is all that is necessary to reduce its visual impact. In other cases, solar panels may be integrated into the roof design to blend into the architecture of the building, with no screening at all.

For historic structures, the National Trust for Historic Preservation generally recommends taking each installation application case by case and looking at screening, minimizing the visual effect of the installation, and using materials that appear similar to others in use on the structure or in the area. For cities with certified local heritage preservation programs, this review is best done by the Heritage Preservation Commission, which is what is presently done in Minneapolis and Saint Paul.

The draft amendment to § 63.110(e) may prevent solar panels from being mounted at right angles to the roof on the front of a house if it can't be done in a way that is integrated into the roof design. But it would allow solar panels to be mounted at right angles to a roof on the back of a house or on an accessory structure in locations where they would have less visual impact.

The current language in § 63.110(e) about "mechanical equipment such as ductwork" on primary building facades does not apply to solar plumbing and solar electric runs, just as it does not apply to Xcel electric runs or rain gutter downspouts. There is no proposed amendment to this language, and it would continue not to apply to solar plumbing and solar electric runs.

Recommendation

Amend § 63.110(e) as proposed in the public hearing draft amendments.

2. Height

Summary

The public hearing draft amendments, in proposed new Sec. 65.921, solar energy system, contain specific regulations both for the height of building mounted solar energy systems and the height of freestanding solar energy systems. Building mounted systems would generally be treated as part of the building, subject to the dimensional standards that apply to the building itself, provided that building mounted systems in residential districts would not be allowed to extend above the ridge of a gable, gambrel, hip or mansard roof, and would not be allowed to extend more than 12 feet above the surface of a flat or shed roof. Freestanding systems would be subject to the height standards for accessory buildings, provided that in residential districts they would have a height limit of 12 feet within 10 feet of a property line, with additional height equal to additional setback to a maximum height of 20 feet. There was public testimony about the impact of these proposed height restrictions on the practical viability and economic feasibility of solar energy installations, with suggestions for changes to the draft regulations to facilitate the increased usage and viability of solar energy systems as called for in the Comprehensive Plan, consistent with the purpose of the Zoning Code and the Solar America Cities grant.

Testimony

Ralph Jacobson, owner of Innovative Power Systems and president of Minnesota Solar Energy Industries Association, noted that limiting the height of building mounted systems in residential districts to the height of the roof ridge may be appropriate in some cases and not in others.

Daniel Williams, owner of Powerfully Green, talked about the necessity of meeting program guidelines for receiving state rebates and utility incentives, including size, angles, and southern orientation. Some cities allow additional height and going slightly above the roof ridge in some cases, particularly toward the rear of buildings and in such places as on accessory structures in rear yards that are less visible, which can facilitate meeting the program guidelines.

Terry Brueck, 2279 Summit, suggested that new § 65.921(a) should "allow solar panels on roofs in the rear of the property to extend above the ridge if not visible from the sidewalk on the front side of the property," . . . "especially allow for roof mounted arrays on garages (or other out buildings on the rear of the property) to extend above the ridge. . .," and "include allowances for solar panels that must be facing south." He said increasing the maximum height of freestanding systems from 20 to 25 feet can improve the payback period of a system by as much as 30%.

James Darabi, Solar Farm, LLC, St. Paul, said a height of at least 15 feet (rather than 12 feet) is needed to provide for standard panels, three feet for snow shed, and optimal tilt angles for our latitude. He also expressed concern about the proposed 20-foot maximum height for freestanding systems in residential districts, and said a 24-foot height would allow for an economical panel size and wiring eight feet off the ground.

Analysis and response

The Minnesota model ordinance recommends that building mounted solar energy systems not exceed the height limit for the district. This allows more height for solar systems in zoning districts with higher height limits. In commercial and industrial districts it also allows more height for solar panels that are set back more, thereby limiting their visual impact. The draft amendments are consistent with this.

Minneapolis and Seattle allow solar energy systems to extend above the building height limit for the district. Minneapolis has a requirement that building mounted systems be setback one (1) foot from the exterior perimeter of a roof for every foot it extends above the parapet wall or roof surface, exempting systems that extend less than three feet above the roof surface. This standard reduces the visual impact of solar energy systems by limiting height at the edge of a roof where it would be most visible, and allows taller, more efficient and economically feasible systems further back from the roof edge, facilitating increased usage of solar energy systems as called for in the Comprehensive Plan.

Minneapolis allows building mounted solar energy systems to extend up to three feet above the roof ridge. Allowing this in residential districts in St. Paul for accessory buildings (which can't be in a required yard except a rear yard) and for principal structures when not readily visible from the front property line would help to facilitate the increased usage of solar energy systems as called for in the Comprehensive Plan, consistent with the purpose of the Zoning Code and the Solar America Cities grant.

The Minnesota model ordinance currently recommends that the height of freestanding systems not exceed 15 feet when oriented at maximum tilt, but based on experience and feedback the MPCA is planning to change this to 20 feet. Minneapolis and Ithaca have a 20 foot height limit. Roseville, CA simply limits freestanding systems to the height standards of the district.

Saint Paul limits accessory buildings in residential districts to 15 feet in height; building height is measured to the average height between eaves and roof ridge, so the ridge of accessory building roofs may commonly be 20 to 22 feet high. Accessory buildings in commercial and industrial districts are subject to the same height standards as principal structures. Allowing freestanding solar energy systems in residential districts to be up to 15 feet high within 10 feet of an interior property line and up to 25 feet high with additional setback equal to the additional height would be consistent with this and with standards is other similar cities.

Recommendation

Amend proposed new Sec. 65.921, solar energy system, to read as follows:

Sec. 65.921. Solar energy system.

Standards and conditions:

(a) Building mounted systems shall be subject to the dimensional standards that apply to the building, provided that the height standards for building mounted systems in residential districts shall be as follows:

(1) The system shall extend no more than three (3) feet above the surface of a roof at its exterior perimeter, and shall be set back at least one (1) foot from the exterior perimeter for every additional foot that the system extends above the height of the roof at its exterior perimeter;

(2) The system shall not extend above the ridge of a gable, gambrel, hip or mansard roof, except that it may extend up to three (3) feet above the ridge of an accessory building, and

may extend up to three (3) feet above the ridge of a principal building when not readily visible from the front property line.

(b) Freestanding systems shall be treated as accessory buildings for the purpose of maximum height, maximum lot area coverage, and location requirements; provided that freestanding systems in residential districts shall not exceed fifteen (15) feet in height within ten (10) feet of an interior property line, except for a property line along an alley, with additional height equal to additional setback from property lines permitted to a maximum height of twenty-five (25) feet.

3. Setbacks

Summary

The public hearing draft amendments, in proposed new Sec. 65.921, solar energy system, use the building setback standards that apply to the building for solar energy systems mounted on a building, and apply setback and locational standards for accessory buildings to freestanding solar energy systems. For freestanding systems in residential districts, the public hearing draft relates setback to system height, with a height limit of 12 feet within 10 feet on a property line and additional height equal to additional setback to a maximum of 20 feet.

Testimony

Terry Brueck, 2279 Summit, suggested changing the setback requirement that relates to the height of freestanding systems in residential districts to pertain just to setbacks from adjacent residential property.

Daniel Williams, owner of Powerfully Green, said the setback requirement that relates to the height of freestanding systems in residential districts should not apply to setbacks along alleys, where systems for "solar car ports" and on garages would need to be more than 12 feet high.

Analysis and response

The setback requirements for buildings help to ensure adequate light and air to adjacent property, a purpose of the Zoning Code. § 63.501(b) of the code requires that "accessory buildings, structures or uses shall not be erected or established in a required yard except a rear yard. All of the compared cities prohibit freestanding solar energy systems in a required front yard and apply the requirements for accessory uses. Allowing taller freestanding solar energy systems along alleys would help to facilitate the increased usage of solar energy systems as called for in the Comprehensive Plan, consistent with the purpose of the Solar America Cities grant and stated purposes in the Zoning Code both to ensure adequate light and air to adjacent property and "to promote the conservation of energy and the utilization of renewable energy resources."

Recommendation

Amend proposed new Sec. 65.921(b) to apply the setback requirement that relates to the height of freestanding systems in residential districts only to setbacks from interior property lines, except for property lines along an alley, as in revised draft Sec. 65.921(b) above.

Recommendations

The Neighborhood Planning Committee recommends that solar energy systems continue to be permitted in all zoning districts as an accessory use, with building mounted systems subject to the dimensional standards that apply to the building, and freestanding systems subject to the standards that apply to accessory structures. "*Solar energy system*" should be specifically added to the accessory uses listed under Article VII, 65.900, Accessory Uses, to clarify this, and to clarify that ground-mounted freestanding solar energy systems are treated as accessory *buildings* for the purpose of maximum height, maximum lot area coverage, and location requirements. The committee recommends the language in proposed new Sec. 65.921 below, responding to issues raised and

suggestions made in public hearing testimony, to add some practical detail to solar energy system regulation in residential districts and help facilitate the increased usage of solar energy systems as called for in the Comprehensive Plan, consistent with the purpose of the Solar America Cities grant and stated purpose in the Zoning Code "to promote the conservation of energy and the utilization of renewable energy resources."

The committee also recommends consideration of the double underlined sentence in the draft amendments below, so that solar energy systems on roofs of traditional narrow commercial buildings immediately next to other commercial buildings, where the systems would not be visible from the street, are not unduly restricted. The 15 foot height is based on testimony from solar installers to provide for standard panels, 3 feet for snow shed, and optimal tilt angles for our latitude.

The Neighborhood Planning Committee recommends amending Sec. 63.110(e) as noted below to apply this general design standard for rooftop equipment to solar energy systems that are not mechanical systems, and help make it clear that § 63.110(e) doesn't require screening to reduce *visibility* of rooftop equipment, but rather requires reducing the *visual impact*, which can be done through such things as location and integration into the roof design as well as by screening.

Recommended Zoning Code Amendments

Sec. 63.110. Building design standards.

(e) The ~~visibility~~ visual impact of rooftop ~~mechanical~~ equipment shall be reduced through such means as location, screening, or integration into the roof design. Screening shall be of durable, permanent materials that are compatible with the primary building materials. Exterior mechanical equipment such as ductwork shall not be located on primary building facades.

Sec. 65.921. Solar energy system.

Standards and conditions:

(a) Building mounted systems shall be subject to the dimensional standards that apply to the building, provided that the height standards for building mounted systems in residential districts shall be as follows:

(1) The system shall extend no more than three (3) feet above the surface of a roof at its exterior perimeter, and shall be set back at least one (1) foot from the exterior perimeter for every additional foot that the system extends above the height of the roof at its exterior perimeter;

(2) The system shall not extend above the ridge of a gable, gambrel, hip or mansard roof, except that it may extend up to three (3) feet above the ridge of an accessory building, and may extend up to three (3) feet above the ridge of a principal building when not readily visible from the front property line.

For systems mounted on a commercial or industrial building within five (5) feet of a commercial or industrial building on an adjoining lot, a system that does not conform to the height standards that apply to the building may extend up to fifteen (15) feet above the surface of a flat roof along the common property line.

(b) Freestanding systems shall be treated as accessory buildings for the purpose of maximum height, maximum lot area coverage, and location requirements; provided that freestanding systems in residential districts shall not exceed fifteen (15) feet in height within ten (10) feet of an interior property line, except for a property line along an alley, with additional height equal to additional setback from property lines permitted to a maximum height of twenty-five (25) feet.

Sec. 65.922~~1~~. Support services in housing for the elderly.