Grow Solar

To: Edward Cohen, Energy Commission Chair
Jeff Ellerbusch, Planning and Policy Division Supervisor
Councilmember Michael Wojcik, Rochester City Council

From: Brian Ross, Great Plains Institute

Date: July 10, 2015

Re: Review of Rochester development regulations for consistency with solar best practices, suggestions for incentives

Background

The City of Rochester has, over time, modified its Zoning Ordinance and Land Development Manual to address solar development and solar resources. Rochester participated in the Minnesota Solar Challenge program (a Minnesota Department of Commerce program funded by the Department of Energy) in 2012, which included an assessment of Rochester's development regulations (working with Phil Wheeler). The assessment and discussion identified priorities for possible improvements to Rochester's regulations to accommodate and encourage solar development. Rochester's current participation as a Beta community in the Grow Solar Partnership offers an opportunity to reassess priorities and opportunities, particularly as the solar energy market has changed significantly in Minnesota in the last two years, and best practices have been refined to address new market realities.

Zoning: The Solar Challenge assessment found that Rochester's solar energy regulatory language was consistent with the zoning best practices for Minnesota communities developed under the Minnesota Solar Challenge program. Rochester's ordinances specifically address basic zoning elements of solar land uses, consistency with dimensional standards, and applicability of coverage standards for both residential and non-residential districts. Rochester achieved the standard of defining an as-of-right installation process for residential and commercial property owners, and providing a clear and predictable path to solar development. The Solar Challenge process finding was that the next step in developing solar ready ordinances was to incorporate regulatory incentives, and consider addressing the relationship between Rochester's standards and common interest community covenants and standards.

Permitting: The Solar Challenge program also examined Rochester's administration of the state building code, via administration of building and electric permits and inspections. Rochester was not using best practices in its permitting processes. Most notably, the process of pulling a building permit for a residential solar installation frequently required conducting a structural analysis of the roof by a licensed engineer. Substantial research into the structural issues of residential solar retrofits has been completed by Minnesota engineers and regulators and national testing laboratories. These findings can help local code officials define clearly when a structural analysis is justified and when such an analysis does not materially improve building safety or lower risk to the homeowner. The State of Minnesota has developed some best practices for determining when structural study or modifications are needed.

New Developments

In the last two years the State of Minnesota enacted several solar energy laws, including 216B.1691 Subd.2f, a 1.5% solar energy standard for the investor-owned electric utilities and 216B.1641, requiring Xcel Energy to develop a community solar garden (CSG) tariff and program. While Rochester's municipal electric utility is not required to comply with either of these standards, the laws have accelerated the accessory use solar market (rooftop and ground-mount) and sparked an interest in different types of solar development than the accessory use model already addressed in Rochester's zoning. Rochester Public Utilities, for instance, participated in a request for proposals to develop larger scale solar development, and has expressed a commitment to meet the 1.5% solar production standard even though they are not subject to the state law.

Zoning Options and Recommendations

In light of these changes to law and solar market development and business models, we have reviewed the Rochester Zoning Ordinance and Land Development Manual to identify barriers and gaps that may be addressed in order to appropriately regulate and encourage solar development. The following points highlight changes the City may consider in modifying its zoning ordinance to accommodate and regulate solar development.

Definition. Solar Farms and Solar Gardens (the two forms of principal solar use) are not identified as permitted or conditional land uses in the Rochester Code of Ordinances, effectively prohibiting them. We recommend that Rochester consider allowing such uses as conditional in appropriate locations (see Use discussion below). As these uses are likely to be proposed in the future, the City should consider adding definitions to Chapter 60.200. Example language is provided below.

> ***Solar Farm*** – A commercial facility that converts sunlight into electricity, whether by photovoltaics (PV), concentrating solar thermal devices (CST), or other conversion technology, for the primary purpose of wholesale sales of generated electricity. A solar farm is the principal land use for the parcel on which it is located.
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> ***Community Shared Solar or Solar Garden*** – A solar-electric (photovoltaic) array that provides retail electric power (or a financial proxy for retail power) to multiple community members or businesses residing or located off-site from the location of the solar collection system. A community solar system may be either an accessory or a principal use.

The Olmsted County ordinance also provides a definition for "solar energy farm" which could be used for consistency between the City and County.

Additional definitions that Rochester should consider include definitions of roof-mount, ground-mount, and building-integrated solar. The first two land uses are already used in the ordinance, and the third is a hybrid land use that could need clarity in regulation. Example language is provided below.

> **Roof-mount** – a solar collection system mounted on a rack that is fastened to or ballasted on a building roof. Roof-mount systems are accessory to the principal use.
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> **Ground-mount** – a solar collection system mounted on a rack or pole that rests or is attached to the ground. Ground-mount systems can be either accessory or principal uses.

Building-integrated Solar Collection Systems – A solar collection system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Building-integrated systems include but are not limited to photovoltaic or hot water solar collection systems that are contained within roofing materials, windows, skylights, and awnings.

Finally, the ordinance includes separate definitions for "solar collection systems" and "solar energy systems." The latter term is not used in the ordinance, the former is used repeatedly. Removing the "solar energy system" definition would be appropriate.

Use. As mentioned above, accessory solar collection systems are listed as a permitted use in all zoning districts. Principal use solar collection systems (solar farms and gardens) are not listed, which effectively prohibits freestanding solar farms or gardens throughout the community. Solar farms/gardens are inconsistent with zoning district goals in most districts, but the city should consider the conditions where such a land use might be appropriate and perhaps desired. Consider the following options:

1. Include solar collection systems as a listed (conditional or interim) principal use (solar farm or garden) where doing so does not affect the cost or expansion of urban services or conflict with surrounding land uses. Principal solar collection systems are not generally appropriate for areas in which urban services are available or are planned to be extended. The suitability question is addressed in more detail below.
2. Develop standards for solar principal uses. As a principal use, the City should identify the conditions that would allow a conditional use to be granted, develop appropriate submittal requirements to be able to evaluate a development proposal against the conditions, and address unique development issues with solar installations such as appropriate mitigation of storm water. For these standards the city may want to distinguish between solar farms and community solar gardens, in anticipation that the CSG concept may ultimately be developed in Rochester.

Solar farms are expressly addressed and encouraged in the Olmsted County ordinance, including performance standards and submittal requirements. Rochester should consider some additional standards that are being used in some communities to capture co-benefits of solar development including creation of stormwater management opportunities and habitat.

Use Suitability. The City may want to encourage solar development through a suitability analysis that would include identifying and protecting potential solar resources.

Such suitability analysis is now much easier than in the past, as Minnesota's solar resources have been mapped for the entire state at a one-meter resolution. The online map can be accessed at http://solar.maps.umn.edu/app/. GPI has acquired the GIS data for the entire state and can provide it to the City.

More importantly, however, other site characteristics can be mapped to identify potentially suitable sites for principal solar uses. Characteristics may include land that is undevelopable, buffer areas around land uses with significant nuisances, or areas slated for development only in the distant future. Examples of these include buffer areas around land uses with safety or

nuisance issues such as wastewater plant or lift stations, wellhead areas and water pumping/purification sites, refineries, mining, and airports.

The solar resource data and policies guiding land use decisions around solar uses should be included in the upcoming update of Rochester's Comprehensive Plan.

Dimensional and Lot Standards for Accessory Uses. As noted above, Rochester's solar accessory use standards height, setbacks, and coverage are consistent with best practices and have little need for modification. One recommended addition is to distinguish between solar collection systems that are mounted on buildings, and those that are "building-integrated" (see the definition, above). Best practices for building-integrated systems are to expressly define the systems are being regulated as a part of the building or accessory use, rather than as a solar collection system. In other words, a solar awning on the side of a building is regulated as an awning, not a solar collection system. A carport or deck shading structure that uses solar panels as the shading or roof element is a carport or deck structure, not a solar system. Building-integrated applications are still not common, but are likely to become more common in the future.

A simple additional provision existing language at 62.277, Subd2, h. and 62.395 Subd. 7B.(8), *Building-integrated solar collection systems are exempt from these standards but shall meet all standards associated with the building component, including but not limited to roof, awning, accessory building, or deck structure.*

Incentives

Rochester has a number of opportunities to incorporate solar development in the existing incentive provisions of its ordinance, and can also adopt additional (or alternate) incentive provisions that encourage solar development. Zoning incentives can shape the design or characteristics of development or redevelopment, capturing opportunities to incorporate solar collection systems in a more cost-effective manner than a later retro-fit.

Zoning and development incentives are generally limited to changing the shape of new development and have little effect on existing development. Zoning is a reactive tool, working only when market conditions for development are right and private sector proposals come forward. Fortunately, Rochester has a robust development market and private sector proposals can be shaped through the use of incentives and standards.

Solar can, for instance, be added to Rochester's existing incentive development section (62.600), and more specifically, to the criteria section (62.630). A new criteria, Subd. 3 m., could use language such as:

> ***Development and Protection of Solar Resources***: *The proposed development incorporates designs and facilities to use or encourage use of on-site solar resources, including: solar-ready building design consistent with EPA's Renewable Energy Ready buildings or SB2030 building standards to meet net-zero energy building standards; incorporation of rooftop solar PV or thermal collection systems; development of community solar energy collection systems to allow for off-building capture of solar resources. Consideration shall be given, if opportunity is available, to create solar easements or covenants to protect solar resources in a subdivision process.*

These provisions are examples, and other concepts can also be addressed in the criteria section.

Additional detail can be added in the bonus density section (62.640) for targeted types of development. For multi-family development, for instance, the following provision could be added to 62.653 as a criteria for awarding bonus density in the R-4 and CDC-Residential districts:

> *Rooftop solar design or inclusion of rooftop solar collection systems that can offset on-site electrical or thermal energy use.*

Similarly, commercial development could incorporate solar collection systems and qualify for density bonuses in Section 62.654:

> *Designs for flat roofs to structurally accommodate the development of rooftop solar resources (solar-ready design) or actual incorporation of solar technologies in the final building design.*

Section 62.658 (All Development) could include a general criteria such as:

> ***Clean Energy Systems***. *The developer provides infrastructure for use or development of micro-grids, district energy systems, on-site energy storage; ensures incorporation of solar-ready or net-zero energy building design; or incorporates solar collection systems to offset a significant portion of likely on-site energy use or capture a significant portion of the on-site solar resource.*

Similar provisions can be added to 62.700, Restricted Development, where the developer is granted regulatory flexibility, primarily on the mix of allowed land uses, under certain conditions.

Other Incentives and Requirements

Rochester also uses (or has at its disposal) a wide variety of non-regulatory tools to encourage specific types of development, including assembly of parcels for redevelopment or economic development, property tax incentives, tax increment financing, provision of infrastructure or preparing sites for redevelopment through building removal or brownfield mitigation. In these examples and similar development activities the City is a financial partner in the development process. The city has a vested interest in ensuring that such development is economically, environmentally, and socially sustainable over time.

When the City is a financial partner in a development process, the city can choose to ensure that the development proceeds in a manner to enable the use of solar resources on the property. Such provisions can be incorporated on a case by case basis, but the transparent and predictable process would be to list priority amenities or development conditions that might be requested when the City is a financial partner. A more complete discussion of these concepts can be found in the APA Planning Advisory Service publication *Planning for Solar Energy* which is available on the National APA website (free of charge).

Permitting

The City of Rochester has opportunities to modify its residential permit application process to be consistent with Minnesota's model process and national best practices for solar development. Minnesota's best practice examples recognize in the permit application process those circumstances when submittal or inspection requirements for small solar installations can be simplified without compromising the safety standards and other goals of Minnesota's Building Code. The Minnesota Department of Labor and Industry has posted guidance materials for building code officials and contractors on its website that includes reference to Minnesota and national best practices (https://www.dli.mn.gov/ccld/ElectricalSolar.asp).

A critical question often associated with residential rooftop solar installations is whether the contractor needs to have a structural analysis completed in order to acquire a building permit. There has been substantial analysis of this question both in Minnesota and nationally, and empirical testing of residential roof systems' structural capacity. Code officials in Minnesota have incorporated standards in which a flush-mounted PV system installed on a residential roof in good condition does not warrant the cost of conducting and reviewing an engineering study (see Minneapolis example, http://www.ci.minneapolis.mn.us/www/groups/public/@regservices/documents/webcontent/convert_272925.pdf). Each city's code official needs to consider these studies and findings in the context of their community's building stock, snow load requirements, and other local conditions.

Finally, we recommend that Rochester develop a solar permitting guidance document, checklist, or separate application permit and put the document on its web site, along with other downloadable permits and guidance documents. Making sure that these standards are clear and predictable and accessible will ensure that as the solar industry continues to grow, contractors and City staff will have clear guidance for meeting Rochester's standards.

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Conclusion

The Grow Solar Partnership can direct you to additional resources and provide some additional technical assistance with implementing these recommendations. Feel free to call or email with questions on the content here.

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