

Grow Solar

Local Government Solar Toolkit

PLANNING, ZONING, AND PERMITTING

Wisconsin



Local Government Solar Toolkit

The Grow Solar Local Government Toolkit is a 3-state collaborative project funded by the U.S. Department of Energy.

Acknowledgment: The information, data, or work presented herein was funded in part by the Office of Energy Efficiency and Renewable Energy (EERE), U.S. Department of Energy, under Award Number DE-0006544.

Disclaimer: the information, data, or work presented herein was funded in part by an *agency* of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Contact Information

If you have any questions regarding planning, zoning, and permitting for solar energy please contact:

Brian Ross, AICP, LEED Green Associate

Great Plains Institute

betterenergy.org

Office: 612-767-7296

Mobile: 612-501-1531

bross@gpisd.net

Abby Finis, Associate Planner

Great Plains Institute

betterenergy.org

W: 612-767-7295

C: 612-245-4070

afinis@gpisd.net



**GREAT PLAINS
INSTITUTE**

Better Energy.
Better World.

Rooftop Solar Toolkit Summary

Planning, Zoning, and Permitting

As part of the Grow Solar Partnership, toolkits have been assembled to equip local governments in Minnesota, Wisconsin, and Illinois with information regarding solar development as it relates to



planning, zoning, and permitting. The purpose of these toolkits is to provide resources that will assist communities in addressing barriers to solar energy installations in a manner tailored to each community's needs. The following is a summary of materials that can be found in each of the toolkits.

Solar Overview

State Solar Policy Summary

Solar policy plays an important role in the development of solar energy. This document includes highlights from each state in both the regulatory arena as well as financial incentives that are available to support solar. Additionally, the State Solar Policy Summary includes statutes that enable local governments to regulate solar in planning, zoning, and permitting. This document can be used as reference guide specific to each state.

Three State Regional Analysis

The Three State Regional Analysis looks at the 3-state region of Minnesota, Wisconsin, and Illinois to identify similarities and differences in state law and typical practices in permitting, planning, and zoning for solar energy development. This document serves as the foundation for the toolkits that were developed for each state. Using this analysis, national best practices were modified so that they could be integrated into each state's regulatory framework insofar as it relates to solar development.

Planning

Comprehensive Plan Guide

The Comprehensive Plan Guide is a tool communities can use when they update their land use plans. This document outlines considerations that communities should make and identifies elements that allow for clear priorities around solar energy objectives. Model language is included to help local governments see the types of goals and policies they could include in their plans.

Zoning

Model Ordinances

All local governments with the authority to regulate zoning should include solar development in their zoning code to recognize the value of solar and alleviate any local concerns. These model ordinances offer language to address a variety of solar land uses, tailored to local conditions and priorities.

Permitting

Local Government Permitting Checklist

Providing a clear and predictable permitting process saves time and money for both contractors and municipalities. Using national best practices, a template has been created that can be adapted locally, with notes on where municipalities might choose to modify standards based on varying circumstances.



State Solar Policy Summary

Wisconsin

Wisconsin has policies in place that support the growth of renewable energy. The state has also seen growth in the solar industry in recent years and has a robust supply chain. Recent regulatory rulings regarding rate structures and distributed generation customers has cast some uncertainty on the solar development market in Wisconsin. Fortunately, the state has solar rights statutes that protect solar development and set a statewide standard for solar rights.

Solar Policy

Wisconsin's solar policies include:

- **Renewable Portfolio Standard** ([Wisconsin Statute § 196.378](#)). In 2005, Wisconsin enacted a Renewable Portfolio Standard, which set a goal that 10% of statewide energy would come from renewable sources by 2015.
- **Net Metering**. Net metering, initially created under Public Service Commission order (Order 6690-UR-107, effective January 1, 1993), allows owners of renewable energy systems no larger than 20 kW to sell excess generation back to the utility at retail rates.
- **Interconnection Standards**. In 2004, the Wisconsin Public Service Commission adopted interconnection standards for distributed generation systems up to 15 MW in capacity.

Solar Market

Available solar incentives and programs include:

- [Milwaukee Shines](#) is a solar program run by the city of Milwaukee that works to expand solar energy use through a comprehensive, citywide approach. The program has streamlined the permitting process, created a solar zoning ordinance, and provides financing resources for home and business owners.
- [Renewable Rewards Program](#) is a partnership between Focus on Energy and Wisconsin utilities that helps to offset installation costs by offering cash-back rewards for solar electric systems.
- [Power Pack](#) is an innovative, community-based solar market development program in Wisconsin. The Midwest Renewable Energy Association works in target communities to provide education and resources that simplify the process of installing solar energy systems.
- [Solar and Wind Energy Equipment Exemption](#): any value added by a solar energy system can be exempt from general property taxes.

In 2014, 2 MW of solar electric capacity was installed in Wisconsin. Currently, 20 MW of solar energy is installed in the state, ranking 28th in the nation. It is unclear how the solar development market will be affected by recent regulatory rulings. In spite of the regulatory rulings, Wisconsin has seen growing interest in community shared solar models, in both the investor-owned and the member-owned utility industry.



Statutory Context – Local Authority

Enabling Statutes for addressing solar resources

1. Comprehensive Planning

- [Wisconsin Statute 66.1001](#) Comprehensive Planning. Wisconsin's Comprehensive Planning statute does not single out solar energy planning requirements, but broadly calls out the need to address critical natural and economic resources in the Plan. Local governments can address solar resources and solar development under these provisions.

2. Zoning

- [Wisconsin Statute 62.23 \(7\)](#), Zoning, grants authority to cities and villages to regulate and restrict by ordinance, the development of their jurisdiction.
- Wisconsin Statute 60.61(2)(i), General Zoning Authority for Towns, specifically enables towns to provide for access to sunlight for solar energy systems in zoning regulation.

3. Solar Rights

- Wisconsin has a strong solar rights statute that creates a common format and structure for solar zoning. Wisconsin state law, [66.0401](#) Regulations relating to solar and wind energy systems states:
No county, city, town, or village may place any restriction, either directly or in effect, on the installation or use of solar energy system [...].
- Further, [66.0401 \(2\)](#), provides local governments the authority to enact an ordinance that would require the trimming of vegetation that blocks solar equipment, provided the solar energy system was installed prior to the planting of the vegetation.

4. Home Owners' Associations

- [Wisconsin Statute 236.292](#) voids all restrictions on platted land that would prevent or restrict the construction of solar energy systems. The law effectively prohibits any private land use controls from preventing the installation of solar energy systems.

5. Solar Access

- [Wisconsin Statute 700.41](#), Solar and Wind Access, protects owners of solar energy systems from obstruction of sunlight. The law states:

The purpose of this section is to promote the use of solar and wind energy by allowing an owner of an active or passive solar energy system or wind energy system to receive compensation for an obstruction of solar energy by a structure outside a neighbor's building envelope as defined by zoning restrictions in effect at the time the solar collector or wind energy system was installed.

- [Wisconsin Statute 844.22](#), Obstruction of solar or wind energy system, states:

Any structure that is constructed or vegetative growth that occurs on adjoining or nearby property after a solar energy system, as defined in 13.48 [...] is installed on any property, that interferes with the functioning of the solar or wind energy system, is considered to be a private nuisance.

Solar in Comprehensive Planning

Purpose

Comprehensive plans are the foundational policy document reflecting a community's priorities and values regarding development and local resources. Solar energy resources are an increasingly valuable local resource — solar development can bring environmental and economic benefits to a community through clean energy production, creation of local jobs and revenue, and improved property values. Communities are acknowledging this valuable resource and incorporating support and guidance for solar energy development into comprehensive plans, sending a strong message of commitment for sustained growth in the solar energy sector.

Communities are not, however, always familiar with the characteristics of solar resources and solar land uses. This document outlines considerations that communities should make and identifies elements that allow for clear priorities around solar energy objectives. Identifying how solar development can benefit the community will help decision-makers determine how solar resources and investments are integrated into the community in a way that balances and protects competing development or resources.



Downtown Solar Resource Map. Rochester, MN

Considerations

When addressing solar development in a comprehensive plan, it is important to acknowledge what makes solar work for a community as well as the inherent conflicts that may arise. Any comprehensive plan that includes a solar component should:

1. Address the solar resource and the different land use forms that solar development can take
2. Acknowledge the multiple benefits of solar development
3. Guide decision-makers on optimizing opportunities when solar development might conflict with other resources or land use forms

Each of these components can help a community identify how they wish to include solar as a resource and to be able to reasonably justify why and where solar development is supported.

Additionally, in Wisconsin, [Statute 66.1001 Comprehensive Planning](#), outlines the elements that must be included in a comprehensive plan. Elements where solar goals and policies may be added include: *Issues and Opportunities; Utilities and community facilities; Agricultural, natural, cultural resources; economic development; and land use.*

Grow Solar

Solar Resource

The local landscape (e.g., topography, on-site obstructions, obstructions on adjacent land, potential future obstructions) defines whether or not a given site has a good solar resource. An adequate solar resource is a site that is unshaded for at least 6 hours a day, both now and into the future. Communities can map their solar resource using LiDAR data that is frequently available in urban areas, and in some states even in rural areas. Such a map can allow the community to measure the size of their “solar reserves” identify areas with good and poor resources for prioritizing development in a manner consistent with other land uses, and even distinguish between opportunities for rooftop and ground-mount solar development opportunities.

In addition to measuring and recognizing the solar resource, communities should recognize that a variety of methods exist to capture the energy and provide economic value. There are several different types of solar installations a community will want to consider: rooftop, accessory ground-mount, and principal ground-mount. A community can use the comprehensive plan to determine which of these technologies to support and/or promote.

Solar Benefits

Communities can realize a number of benefits through solar development, including environmental, energy production, and economic development.

Environmental benefits include helping meet local air quality or climate protection goals. Communities with renewable energy or energy independence goals can better achieve these through explicit support of solar energy development. Economically, solar development creates construction jobs for a variety of trades, financially benefits those who install systems on their properties with lower energy bills, and increases the property value of buildings within the local housing market.

Land Use Conflicts

Like any development, solar may come into conflict with other land uses, and solar resources are often co-located with other important local resources.

Recognizing these issues in the comprehensive plan can help to mitigate future problems.



Rooftop Solar, MREA



Ground Mount System, CERTs



Solar Farm, CERTs

Grow Solar

Some conflicts to consider include:

- Agricultural practices
- Urban forests
- Historic resources
- Airport control towers
- Natural areas
- Future housing or commercial development

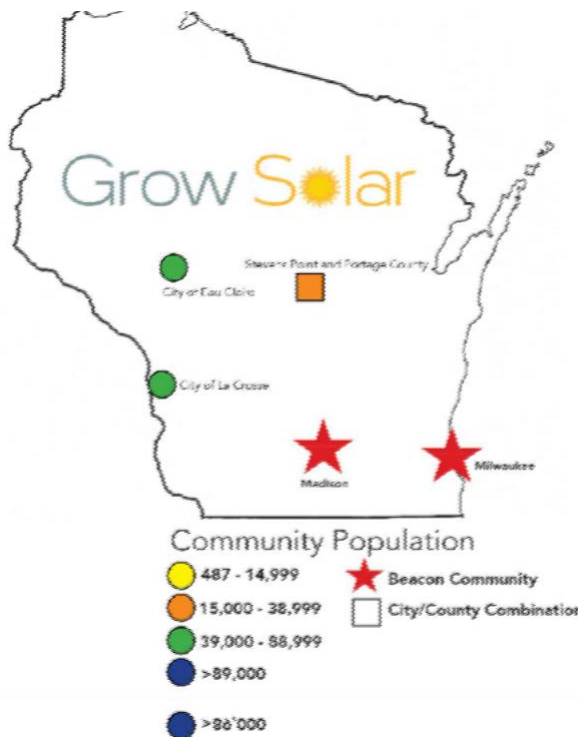
Each community is different and may see conflicts arise that are not listed here. Identifying and addressing those conflicts in comprehensive planning will need to happen at the community level.

Elements

Common features of a comprehensive plan include a discussion of existing conditions, a presentation of desired outcomes in the form of a vision and goals, and an inventory of policies and actions that support those goals. The following model language are examples of what could be incorporated into a comprehensive plan.

Existing Conditions

Understanding the potential importance of a community's solar resource requires some knowledge of both the availability of the local solar resource and the community's existing energy use. Using a solar map, like the one described above, is a useful way to demonstrate the solar potential across the area. Identifying the areas with the greatest potential can help the community plan and prepare for the best



Map courtesy of Midwest Renewable Energy Association

sites to locate solar investment and to achieve the goals outlined in the plan. Understanding the nature of the community's energy use—data that can be obtained from the community's utility providers—can put the solar resource within the appropriate economic and use intensity context. For instance, most communities have sufficient solar resources to theoretically meet a substantial portion of their electric energy consumption, even if only the best resources are used.

Goals

Among communities that have added renewable energy goals and objectives to their plans, common themes include encouraging solar site design for new subdivisions, improving the energy performance of municipal facilities, removing barriers and creating incentives for small-scale or "distributed" installations, and capturing economic development opportunities associated with renewable energy investment.



Examples of goals may be:

Goal 1: Encourage local production of solar energy on new residential and commercial construction.

Goal 2: Maximize the production of solar photovoltaic energy to the extent feasible, while minimizing potential biological, agricultural, visual, and other environmental impacts.

Policies and Actions

In Comprehensive Plans, policies are statements of intent with enough clarity to guide decision-making. Policy statements should be tied to the desired goals and set a clear path to action. Examples of policies are:

Policy 1: Establish clear guidelines for solar ready development in all zoning districts where solar is a permitted use.

Policy 2: The City supports the State's effort to achieve the Renewable Portfolio Standard (RPS), which requires utilities to generate 25% of electricity from renewable energy sources, and the State's solar energy goal of having sufficient solar generation to meet 10% of electric use by 2030.

Actions are more specific statements that direct programs, regulations, operational procedures, or public investments. Action statements are intended to guide the implementation of the stated policies. Examples of action statements follow:

Action 1: Provide incentives for developers who build solar-ready residential and commercial structures.

Action 2: The City should complete a study to identify opportunities for investment in solar energy resources on public buildings and lands.

Additional Resources:

Planning for Solar Energy, American Planning Association

https://www.planning.org/store/product/?ProductCode=BOOK_P575

Planning Advisory Service Essential Info Packets, Planning and Zoning for Solar Energy

<https://www.planning.org/pas/infopackets/open/eip30.htm>

Iowa Smart Planning Principles, Statute, Guidance document on-line.

https://rio.urban.uiowa.edu/sites/rio/files/iowa_Smart_Planning_Overview_0.pdf

Minnesota Solar Planning Requirement – [Metropolitan Land Planning Act 473.859. Subd.2b](#)

Metropolitan Council [Local Planning Handbook](#)

Illinois Planning Authority for Protection Solar Resources ((65 ILCS 5/11-12-5) (from Ch. 24, par. 11-12-5)

<http://www.ilga.gov/legislation/ilcs/fulltext.asp?DocName=006500050K11-12-5>

Photos are courtesy of the **Clean Energy Resources Teams & the Midwest Renewable Energy Association**

4

Model Solar Zoning for Wisconsin Municipalities

Every Wisconsin community should have zoning language that addresses solar energy systems. Including solar zoning in a community's code of ordinances can help educate staff and community, as well as alleviate any potential conflicts or confusion. Solar energy zoning ordinances can also aid city staff when processing permits or doing field inspections.

Wisconsin has state statutes that protect a resident's right to install and operate a solar energy system. These state laws address zoning restrictions by local governments and private land owners, as well as protect system owner rights to unobstructed access to resources.

Each municipality can model its own zoning language after these state laws. Without solar energy zoning ordinances, other existing local zoning ordinances could conflict with the Wisconsin state laws and could create difficulties for home or business owners to invest in solar energy.

The City of Milwaukee, through the City's solar program *Milwaukee Shines*, has implemented solar zoning. Milwaukee's solar energy zoning was modeled after the **Wisconsin Statute §66.0401**, so it satisfies the state requirements, but also modifies general requirements to fit to the Milwaukee community.

The model zoning language from the City of Milwaukee can be found below. Municipalities are encouraged to add this language to existing zoning ordinances to clarify solar access rights for residents and to help staff and elected officials encourage properly sited solar installations.

Practice Pointer: Municipal staff that will be drafting solar zoning language will be educating elected officials. They should prepare a PowerPoint with pictures of different types of solar installations. See [City of Milwaukee Zoning Presentation](#) as an example.

Questions? If you would like to develop solar zoning for your community, please contact:

Great Plains Institute for Sustainable Development

2801 21st Avenue S, Suite 220

Minneapolis, MN 55407

bross@gpisd.net

612-767-7296

Midwest Renewable Energy Association

1845 N Farwell Avenue, Suite 100

Milwaukee, WI 53202

peterm@midwestrenew.org

414.431.0907

City of Milwaukee Model Solar Zoning Language

Definitions: The City of Milwaukee used the definitions provided in the Wisconsin state statute to clarify what equipment is used as part of a solar energy system and for what land uses. Definitions included in the City of Milwaukee solar energy zoning were: solar collector, solar array, and solar farm.

Solar Collector: A device, structure, or part of device, the substantial purpose of which is to transform solar energy into thermal, mechanical, chemical, or electrical energy.

Solar Array: An accessory system or device that is roof-mounted or ground-mounted with poles or racks used to collect radiant energy directly from the sun for use in a solar collector's energy transformation process.

Solar Farm: An array of multiple solar collectors on ground-mounted racks or poles that transmit solar energy and is the **primary** land use for the parcel on which it is located.



Solar Electric Ground-Mounted Solar Array at Discovery World

Solar Access Rights: The authority to restrict systems is limited by Wisconsin state law. This is noted in the state statute and should be replicated in municipal zoning. Milwaukee zoning meets the minimum requirements of the state statute so residents have full access to install solar throughout the city. In addition, this language referring to the state statute helps the Milwaukee Board of Zoning Appeals if issues regarding solar access rights come before the committee. For further details, read the [Wisconsin State Statute §66.0401](#).

General Requirements: When it comes to land use regulations, Milwaukee did not see a need for many requirements, as most urban installations of solar are typically rooftop installations. However, general setback restrictions may need to be addressed on solar ground-mounted systems and solar farms for land use purposes. The purpose of setting these minimal requirements is to provide satisfaction for neighbors while ensuring that the restrictions do not increase the price or decrease the efficiency of a property owner's solar energy system. The City of Milwaukee looked to existing structures and uses to set general requirements:

Ground-Mounted Solar Energy Systems Setback Requirements:

- If less than 20 feet in height: setback must comply with 1.5 feet from all property lines.
- If greater than 20 feet in height the ground-mounted solar energy system must comply with setback regulations for a principal building structure.

In addition, the City of Milwaukee set general requirements for signage in regards to solar energy systems. Only one sign is allowed per solar array. The display area must be less than six square feet in size and must be either for acknowledgement or educational purposes.

Permitted Uses: No resident or business owner can be restricted in installing solar due to [Wisconsin State Statute §66.0401](#) unless the restriction satisfies one of the following conditions¹:

- Serves to preserve or protect the public health or safety.
- Does not significantly increase the cost of the system or significantly decrease its efficiency.
- Allows for an alternative system of comparable cost and efficiency.

¹ Note here the absence of the typical language "serves to protect the public health, safety, or *welfare*" language. The legislative history of this statute indicates lawmakers specifically eliminated the term *welfare* from the language. Communities (or private subdivisions) can limit solar power only for health or safety reasons; not for other reasons like aesthetics.

Solar Farms: With solar energy becoming a mainstream source for energy for homeowners and business owners, solar farms are becoming more prevalent in cities across the United States, especially as a way to deal with brownfield sites or other undevelopable pieces of property. Cities need to prepare with solar farm zoning. Below is the City of Milwaukee’s definition of a solar farm:

Solar Farm: An array of multiple solar collectors on ground-mounted racks or poles that transmit solar energy and is the **primary** land use for the parcel on which it is located.



Solar Farm - MATC Blue Hole Project Located on Capitol Drive in Milwaukee.

Since solar farms are the primary use for a parcel of land, setbacks were determined based on existing setback requirements for

principal structures that functioned as the primary use as determined by Milwaukee’s current zoning districts.

To maintain the character of certain neighborhoods and districts, the City of Milwaukee applied a special use for solar farms in some zoning districts. If a solar farm is proposed in a special district it goes before the City of Milwaukee Board of Zoning Appeals to address issues related to solar in that zoning district as applicable to the community. Below is the table that outlines permitted uses for solar farms in the City of Milwaukee:

Solar Farm Setback Requirements:

- o Cannot exceed setback requirements for principal structures as primary use as determined by zoning district.

Zoning District	Use
Residential	Permitted
Commercial	Special
Commercial Services	Permitted
Downtown	Special
Industrial	Permitted
Special (Schools, parks)	Permitted
Lakefront Overlay	Special

Historic Preservation: A municipality’s typical historic preservation process may also need to be clarified to be consistent with [Wisconsin State Statute §66.0401](#). When creating solar zoning ordinance, it will be important to include the historic preservation office or staff in this process. The cities of Milwaukee and Madison developed community-specific approaches to balanced solar and historic resources. These examples are consistent with the guidance from the Department of the Interior, which manages historic designations at the national level, and the National Trust for Historic Preservation.

Resources and Reference Material

- National American Planning Association, *Planning for Solar Energy*, https://www.planning.org/store/product/?ProductCode=BOOK_P575
- National American Planning Association, Planners Advisory Service Essential information packet, <https://www.planning.org/pas/infopackets/open/eip30.htm>
- University of North Carolina, *Planning and Zoning for Solar Energy*, <http://sogpubs.unc.edu/electronicversions/pdfs/pandzsolar2014.pdf>
- Solar ABCS, *A Comprehensive Review of Solar Access Law in the United States*, <http://www.solarabcs.org/about/publications/reports/solar-access/pdfs/Solaraccess-full.pdf>
- The Solar Foundation, *A Beautiful Day in the Neighborhood: Encouraging Solar Development through Community Association Policies and Procedures*, <http://www.thesolarfoundation.org/a-beautiful-day-in-the-neighborhood-encouraging-solar-development-through-community-association-policies-and-processes/>
- National Alliance of Preservation Commissions, *Sample Guidelines for Solar Systems in Historic Districts*, <http://www.preservationnation.org/information-center/sustainable-communities/buildings/solar-panels/additional-resources/NAPC-Solar-Panel-Guidelines.pdf>
- National Trust for Historic Preservation, *Solar Panels and Historic Preservation*, <http://www.preservationnation.org/information-center/sustainable-communities/buildings/solar-panels/#.VUJ32JNi91A>

Solar Permitting for Wisconsin Municipalities

When a home or business owner makes the decision to install solar, the process begins in earnest for the solar installer. A Wisconsin municipality can help reduce the cost of solar by saving the installer time and money during the permitting and inspection process. Making the permit and inspection process transparent and predictable to contractors can help save valuable staff time for municipalities. The [Solar America Board of Code and Standards](#) (Solar ABCS) developed a set of permitting principals and standards for permitting solar installations based on thousands of installations across the nation and years of data collection and research. These standards are the national best practices that local governments across the nation can adapt to their community circumstances.

However, there is not a one-size-fits-all approach for solar permitting in Wisconsin municipalities. Communities of different sizes have different processes. Permitting in a rural village will look different than the process in the City of Milwaukee. Cities of similar size have distinct characteristics in their building stock that call for different approaches to permitting. However, all municipalities use a common building code standard, and should rely on the same principals and standards to make the permitting process transparent, predictable, and based on the best evidence and research. With a new and evolving technology such as solar energy, it is also beneficial to clarify the process so staff are familiar with requirements and the technology.

A template for adapting national permitting best practices to Wisconsin cities is provided below. The template provides standardized solar permit language for Midwestern cities, but also notes where local municipalities might choose to modify the standards. The cities of Milwaukee and Madison have adapted the national permitting best practices to their particular regulatory standards and building stock. These two solar permitting examples (also described below) demonstrate different approaches to using the national permitting standards and best practices. Wisconsin's two "beacon" cities also incorporated additional elements into their permitting processes, such as design standards and heritage preservation.

Additional resources related to permitting processes, standards, and research are included at the end of the document for reference by municipal staff, elected officials and installers.

500 N. Franklin
1st Floor
Milwaukee, Wisconsin
53233-3677
http://city.milwaukee.gov/permits
Phone: (414) 255-5211
Fax: (414) 256-2281

City of Milwaukee
Permitting

Expedited Solar Permit
Building and Electrical Permit
Photovoltaic System 10 KW or less
1 & 2 Family Dwellings

No refund on minimum fee permits
Work is not an "Expedited" permit as indicated if: right

Location (Exact street address - please print)	Use existing	Cost of job	Code	City	Class
Property Owner					
Address					
State					
Zip					
Proposer	Electrical Contractor				
Name		Permittee			
Address		Phone			
City/State		State			
Signature		State Electrical Contractor #			
Job Description - Photovoltaic					
Total size of Array	KW	sq. ft.	Size of Permit	Weight of Permit	lbs.
Description of Work					
<input type="checkbox"/> Wisconsin attached					
Fees					
<input type="checkbox"/> Solar Electrical Permit (6000) \$1 return Fee: \$75.00					\$75.00
<input type="checkbox"/> Number of sub-tracker change	1 to 400 amps (\$25.00)	401 to 600 amps (\$40.00)			\$
<input type="checkbox"/> Charge for cables, trays, switch assemblies, etc.	\$1.00 per sq. ft. of array				\$
<input type="checkbox"/> Total switch capacities, Single phase/3 phase	1 to 400 amps (\$75.00)	401 to 600 amps (\$75.00)			\$
<input type="checkbox"/> 1.4% (GSA) Permitting Surcharge					\$
<input type="checkbox"/> 5000 permit charge					\$
TOTAL:					\$

When you make a check or payment, you will receive a letter to the information from your check or make a check to the number of dollars from your account, or to the permit on which it was made.

I hereby give you advance information that you are about to be proposed and the proposed work to be performed on. I agree to comply with all City of Milwaukee and State of Wisconsin rules and regulations, and to accept the responsibility for the proposed work. I understand that the City of Milwaukee may require a permit for the proposed work. I understand that the City of Milwaukee may require a permit for the proposed work. I understand that the City of Milwaukee may require a permit for the proposed work.

Permit check

Approval conditions

Taskby

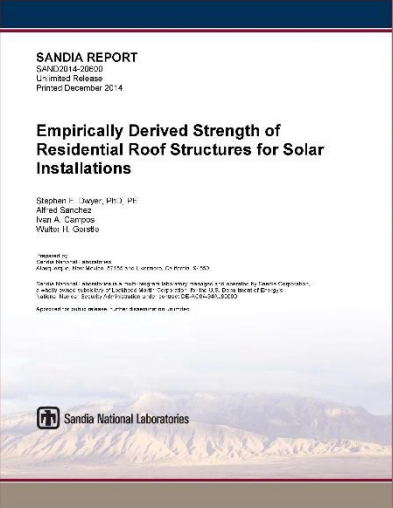
Timing

Work requires SDC approval

Work requires review code

Permit issued by: electrical inspector other

8/23/2014



Standardized Permitting Template

JOB SITE ADDRESS _____

NAME OF BUILDING OWNER _____

JOB VALUATION _____

Installation Contractor	Name _____
	Address _____
	City _____ State _____ Zip _____
	State License No. _____ Phone _____

Required Information for Permit:

1. Site plan showing location of major components on the property and a framing cross section that identifies type of support (rafter or truss), spacing, span dimension, and approximate roof slope. The drawings need not be exactly to scale, but it should represent relative location of components. PV arrays on dwellings with a 3' perimeter space at ridge and sides may not need separate fire service review.
2. Specification sheets and installation manuals for all manufactured components including, but not limited to, PV modules, inverter(s), combiner box, disconnects, and mounting system.
3. *If city manages electric permit process*- Electrical diagram showing PV array configuration, wiring system, overcurrent protection, inverter, disconnects, required signs, and AC connection to building (see accompanying standard electrical diagram).

If location of the solar resource on the roof requires installation within three feet of sides or ridge, check with building official to determine if fire service review is needed.

Step 1: Structural Review of PV Installation Mounting System

1. Is the roof supporting the installation a pitched roof in good condition, without visible sag or deflection, no cracking or splintering of support, or other potential structural defect? Yes ___ No ___
2. Is the roof a rafter system? Yes ___ No ___
3. Is the equipment to be flush-mounted to the roof such that the collector surface is parallel to the roof? Yes ___ No ___
4. Is the roofing type lightweight?
Yes (composition, lightweight masonry, metal, etc...) ___ No ___
5. Does the roof have a single layer roof covering? Yes ___ No ___

For truss systems, additional information may be needed to ascertain the truss' design loads. The SolarStruc tool (<http://www.growsolar.org/wp-content/uploads/2012/06/Solarstruc-2.2.xls>) allows contractors to calculate truss capacity for solar installations. Please contact the building official for standards on when structural analysis will be needed.

If "No" to any of questions 1 -4 above, additional documentation may be required. Documentation may need to demonstrate the structural integrity of the roof and all necessary structural modifications needed to maintain integrity. A statement stamped by a Wisconsin licensed/certified structural engineer certifying integrity may be needed. Contact the building official to determine submittal requirements.

6. Identify method and types of weatherproofing for roof penetrations (e.g. flashing, caulk).

Mounting System Information:

- 7. Is the mounting structure an engineered product designed to mount PV modules with no more than an 18" gap beneath the module frames? Yes ___ No ___

If No, provide details of structural attachment certified by a design professional. Manufacturer's engineering specifications are sufficient to meet this requirement.

- 8. For manufactured mounting systems, fill information on the mounting system below:

- a. Mounting System Manufacturer _____
- b. Product Name and Model # _____
- c. Total Weight of PV Modules and Rails _____ lbs
- d. Total Number of Attachment Points _____ (attachment points must be equally distributed across the array)
- e. Weight per Attachment Point (c÷d) _____ lbs
- f. Maximum Spacing between Attachment Points on a Rail _____ inches (see product manual for maximum spacing allowed based on maximum design wind speed).
- g. Total Surface Area of PV Modules (square feet) _____ ft²
- h. Distributed Weight of PV Module on Roof (c÷g) _____ lbs/ft²

Attaching the rail to each rafter or truss that passes under the array, or to blocking installed between each support, may serve to mitigate for any structural uncertainties on older roofs or wind loading concerns. Contact the building official to determine requirements.

If the outcome of e. is greater than 45 lbs or h. is greater than 5 lbs/ft², a study or statement demonstrating the structural integrity of the installation, or a statement stamped by a Minnesota licensed/certified structural engineer, may be required. Contact the building official to determine requirements.

Step 2: Electrical Review of PV System

Please document the following information to be issued an electric permit. If the installation does not meet the following thresholds, additional information may be needed, as requested by the permit official.

- 1. PV modules, utility-interactive inverters, and combiner boxes are identified for use in PV systems.
- 2. The PV array is composed of 4 series strings or less per inverter.
- 3. The total inverter capacity has a continuous AC power output 13,440 watts or less
- 4. The AC interconnection point is on the load side of service disconnecting means (NEC 2011 705.12(D), NEC 2008 690.64(B)).
- 5. A standard electrical diagram should be used to accurately represent the PV system. Acceptable diagrams, in interactive PDF format, are available at www.solarabcs.org/permitting.

This section should be included in the permit only if the local government administers electric permits and inspections. While a single permit application is preferable, the electric permit application can sometimes be a separate document.

Fill out the standard electrical diagram completely. A guide to the electrical diagram is provided at www.solarabcs.org/permitting to help the applicant understand each blank to fill in. If the electrical system is more complex than the standard electrical diagram can effectively communicate, provide an alternative diagram with appropriate detail.

Step 3: Permit fee for residential installations

___ Fees \$100
___ Additional inspection \$ 50.00
(Per inspection, when needed)

TOTAL FEE = \$ _____

RECEIPT NO. _____

DATE _____

I HEREBY CERTIFY that I have completed and examined this application and certify that the information contained therein is correct. If a permit is issued, I agree all work will be done in conformance with all applicable ordinances and codes of this City and laws of the State of Wisconsin.

CONTRACTOR OR AUTHORIZED AGENT/HOMEOWNER

Recommended fee for residential or small commercial solar installations is a fixed fee between \$50–200, consistent with cost for services (permit processing, inspection) incurred by the government unit. Alternatively, the fee can be valuation based, but for a building permit should exclude the value of the solar collectors and electronics.

City of Milwaukee

The City of Milwaukee created an expedited permit for certain solar installations. The goal was to save time and money for residents who want to add solar to their home. The City created an expedited solar permit that:

- 1) **Reduced Time for Approval.** Reduced the time installers needed to wait for application approval to same-day, in person approval. This was a vast improvement over sometime waiting days or weeks for approval.
- 2) **Reduced Price of Permit.** Reduced the price to a flat fee of \$70. This was reduced from a permit fee based on the cost of the project. In the past this could add a significant cost on to the total system price. Now, installers know it is a flat fee for residential systems.
- 3) **Reduced Second Inspection.** Consideration of residential solar electric systems as an “appliance” added to the home. If the project meets certain weight limitations, the solar system would be considered an electric appliance only. This means there is now no requirement for building inspection after the project was completed (eliminating a second trip to the home for the installer, and additional delays before interconnecting the system).

The Expedited Solar Process: The Expedited Solar Permit is for solar electric (photovoltaic) systems that are 10 KW or less on residential dwellings (one or two units). Sizes larger than this, or if installed on a commercial property will need to go through the traditional plan review process, as outlined by the [Milwaukee Development Center](#).

The Expedited Solar Permit also requires the installer to complete a Structural Worksheet. This worksheet is designed to ensure the weight of the solar installation is at or below five (5) pounds per square foot. This is a recommended weight by the [Solar America Board of Code and Standards](#). If the installation exceeds this weight, the installer will need to obtain an electrical AND building permit, and go through the standard plan review process.

When a solar project is completed, an inspection by the City of Milwaukee is needed. The process for inspections is as follows:

- The Installer must call the City to request inspections using the contact information listed on each permit.
- The Installer must coordinate the inspections to satisfy all permits on the solar project.
- The Installer must meet with each Inspector to close out the permits.
- Once the permits are approved and closed, the Inspector faxes the approved permits to We Energies as part of the interconnection process.
- Please note, Installers must sign a waiver taking responsibility for the project installation if the system is not accessible to the inspectors (for example if the inspector cannot get to the roof).

Source: *Milwaukee Shines*, 200 E. Wells St., Rm 603, Milwaukee, WI 53202, 414-286-8317, solar@milwaukee.gov



City of Madison

There is a 5-step process for installation of solar in the City of Madison. For details visit:

<http://www.cityofmadison.com/Sustainability/City/madiSUN/step.cfm>

Step 1: Preparation

Find zoning information for the property on the city's assessor site. You will need that information to determine what will be needed for the building permit.

- [City of Madison Assessor's Property Lookup](#)
- Property Class:** classification of building; commercial or residential
- Zoning:**
 - CC, CC-T, SR-V1, TR-C1.... - commercial or residential category
 - PD – Planned Development
 - HIS – Historic District
 - UDC – Urban Design Commission
- In case of commercial building, find out the volume in ft³ (larger or smaller than 50,000 ft³)
- In case of residential building, determine if it has more than two family dwelling units.
- In case of PD, HIS or UDC you will need to provide additional documents (see step 3) and it might require more time. Please consider that in your construction schedule.**

Step 2: Produce documents for electrical, plumbing, and heating permits

Electrical, plumbing, and heating permits require the typical documentation to prove that all codes and requirements are met. This should not be a problem for a contractor who is in the business of installing solar systems. Documents needed include but are not limited to:

- Plumbing (for domestic hot water): A catalog cut sheet of the device. Proof that the transfer fluid is either non-toxic or the device has a double walled heat exchanger.
- Electrical: A catalog cut sheet of the electrical photovoltaic device that shows it is UL listed.
- Heating: Information that shows compliance with MGO 30.05. All materials that are used in the system must be listed.
- Proof that applicant holds all necessary licenses.

Step 3: Produce documents for building permit

You will need to pay applicable fees to obtain all the permits. Staff can tell you the exact amount for your specific project at time of application. City of Madison [Fee schedule](#).

Structural Requirements: show with drawings and calculations that the proposed system will be safe at all conditions required by the building code

- Show at least a section of the existing roof showing the attachment and the existing structure.
- Show a catalog cut sheet of the solar device with the weight.
- Different requirements for commercial and residential installations
 - Calculations can be performed by a **knowledgeable** person if the building is in the **residential** category or a **commercial building of up to 50,000 ft³ in volume**.
 - **Buildings larger than 50,000 ft³ in volume require a licensed Professional Engineer or Architect** to perform the calculations.

For all applications: Provide a site plan and placement plan showing the location of the solar energy system on the lot and the design of the solar energy system. The placement plan also shall include the location of

improvements on adjoining lots as well as landscaping on the lot and adjoining lots that impacts the location of the solar system.

If the property is in a historic district:

- Inquire about special requirements and further information. Contact Preservation Planner Amy Scanlon ascanlon@cityofmadison.com or 266-6552 before application.
- Show elevation drawings.
 - If collectors won't be visible from street the Landmarks Commission staff person (Amy Scanlon) can sign off, if collectors are visible from street level the Landmarks Commission needs to approve. Consider this for your schedule! Go to: [Legislative Information Center](#).
- Maps and background information regarding historic districts are available from the [Landmarks Commission](#).
- Consider less visible panel locations and be prepared to provide evidence that less visible locations are less economical.

If the property is in a PD:

- An "Alteration to an approved & recorded specific implementation plan" needs to be approved along with site plan and placement plan of proposed collectors
- The local alder person needs to sign the application before it is submitted to the city zoning department.
- Processing of the application can take two weeks plus the time to obtain alder's signature. [Lookup your Alder](#)
- [Instructions](#) and [application](#) for alterations to an existing PD.

If the property is in a Urban Design district:

- Provide site plan and placement plan of proposed collectors to city UDC staff person who typically can approve the application. Contact Planner Al Martin amartin@cityofmadison.com or 267-8740 before application.
- [Maps of UDC districts](#)

If the property contains a Conditional Use:

- A minor alteration to the conditional use is required.
- Provide a site plan and placement plan of proposed collectors and contact zoning staff at 266-4551.
- [Instructions](#) and [application](#) for alterations to an existing conditional use.

Step 4: Application

In case your property is in a PD, Urban Design district, or historic district, contact the appropriate staff (s. step 3) to make special arrangements prior to your application. These staff might not be available if you show up unannounced and the process might require more days.

In cases where the PD, Urban Design district, or historic issues are resolved or not applicable, show up at the permit office during business hours with all your documents and be prepared to pay the fees. If all documents are complete and acceptable, you will receive your permit right away.

Step 5: Approval

Once approved you will receive the permits, which need to be displayed at the construction site. The permit will include contact information for the inspector(s) who can answer more questions. **You will need to schedule for inspections during and after construction.** Work needs to be inspected before you may proceed with the next step. After completion there will be a final inspection. You are responsible to arrange those inspections with the inspector.

Resources

- National Renewable Energy Lab: *Permitting Best Practices* <http://www.nrel.gov/docs/fy13osti/57104.pdf>
- Interstate Renewable Energy Council: *Solar Permitting Best Practices*: <http://www.irecusa.org/solar-permitting-best-practices/>
- Solar America Board for Code and Standards (Solar ABCs): *Expedited Permit Process*, with sample line drawings for all installation types: <http://www.solarabcs.org/>
- Sandia National Laboratories, *Empirically Derived Strength of Residential Roof Structures for Solar Installations*, <http://prod.sandia.gov/techlib/access-control.cgi/2014/1420600.pdf>
- SolarStruc Tool, <http://www.growsolar.org/wp-content/uploads/2012/06/Solarstruc-2.2.xls>
- Minneapolis Saint Paul Solar Cities Program, *Standards for Rooftop Solar Thermal Retrofits*,
- Minnesota Division of Energy Resources, *Standardized Load Tables Characterizing Residential Solar Thermal and Solar Electric Installations for Residential Structures*, <http://mn.gov/commerce/energy/images/FINAL-Standardized-Load-Table-Report.pdf>
- Inspection trainings – link to MREA / CLE training opportunities