

# Solar

## Connecting to the grid



## taking responsibility

As an individual, your efficient use of energy brings benefits such as lower bills, improved comfort levels in your home and a reduced personal impact on the environment.

Acting together, our individual choices add up—for the benefit of our community, our environment and our energy future. That's the power of working together.

As your community energy company, we are committed to sharing our experience and energy expertise. You can always contact us for:

- Answers to your energy questions.
- Energy efficiency information and advice.
- Help in evaluating energy-saving options.
- Assistance in finding energy-efficient products.

## Guide for installing photovoltaic systems

As rooftop solar becomes more affordable, more businesses and homeowners are installing photovoltaic (PV) systems. MGE wants to help installers integrate customer solar projects to the grid.

This guide walks you through the process and explains the requirements for connecting PV systems to MGE's electric distribution system. Statewide standards—Wisconsin Administrative Code Chapter PSC 119—help ensure the interconnection process is safe, reliable and consistent. All public utilities, customers and installers are responsible for following these standards.



## Step 1 - Call MGE

Call MGE at 608-252-5654 to tell us about your plans to interconnect a PV system to the MGE electric distribution system. For larger installations, in particular, it's helpful for MGE's engineering department to be aware of the project early on so we can start reviewing the electric distribution system. MGE may also meet you on site to discuss the plan and project timelines before work begins.

Download an application form, available at [mge.com/interconnection](http://mge.com/interconnection).

- For projects less than 20 kilowatts (kW), use Distributed Generation Application Form 6027.
- For projects greater than 20 kW and less than 15 megawatts (MW), use Distributed Generation Application Form 6028.
- For projects greater than 15MW, call MGE at 608-252-5654.

## Step 2 - Complete the Distributed Generation Application Form and send it to MGE

Complete, sign (applicant and project designer/engineer) and send the application with the required attachments and application review fee to:

DG Application Form  
Laura McFadden  
Madison Gas and Electric Company  
PO Box 1231  
Madison, WI 53701-1231

For application review time and fees, see the chart below.

PV System Size	Application Review	
	Time Limit*	Fee
Category 1 ( $\leq 20$ kW)	10 days	none
Category 2 ( $> 20$ kW and $\leq 200$ kW)	10 days	\$250
Category 3 ( $> 200$ kW and $\leq 1$ MW)	10 days	\$500
Category 4 ( $> 1$ MW and $\leq 15$ MW)	10 days	\$1,000

\*Time limit is working days

# What information should I attach to the application?

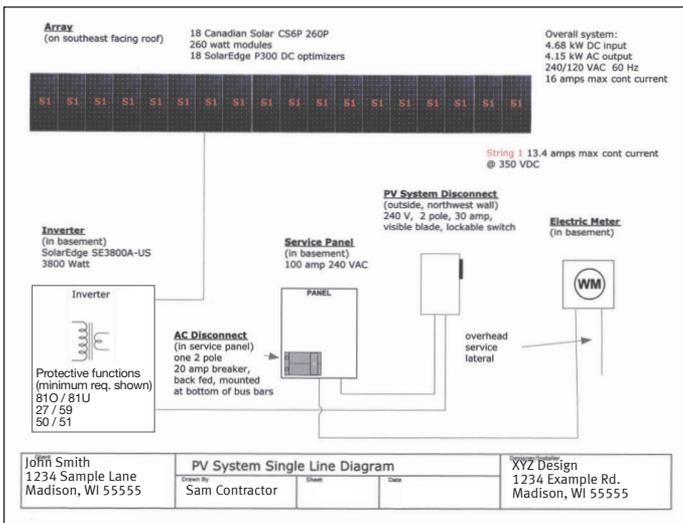
Along with your application, please include the following:

- One-line schematic diagram
- Proof of required liability insurance
- Site plan
- Application review fee

# What should be included in the one-line schematic diagram?

- Generator or inverter
- Point of distributed generation connection to customer's electrical system
- Point of common coupling
- Lockable interconnection disconnect switch – must be located outside
- Method of grounding (generator and transformer ground connections)
- Protection functions and systems
- Size of installation (kW AC)

Here is an example of a complete one-line schematic diagram.



## What are the insurance requirements?

Insurance requirements are outlined in PSC 119. The chart below shows the minimum liability insurance coverage based on PV system size. Coverage is negotiable for systems greater than 1 MW and less than 15 MW (Category 4). MGE will work with the customer and insurance company to determine the appropriate coverage for Category 4 systems.

MGE must also be named as an additional insured party in the customer's liability insurance policy for all Category 2, 3 and 4 installations.

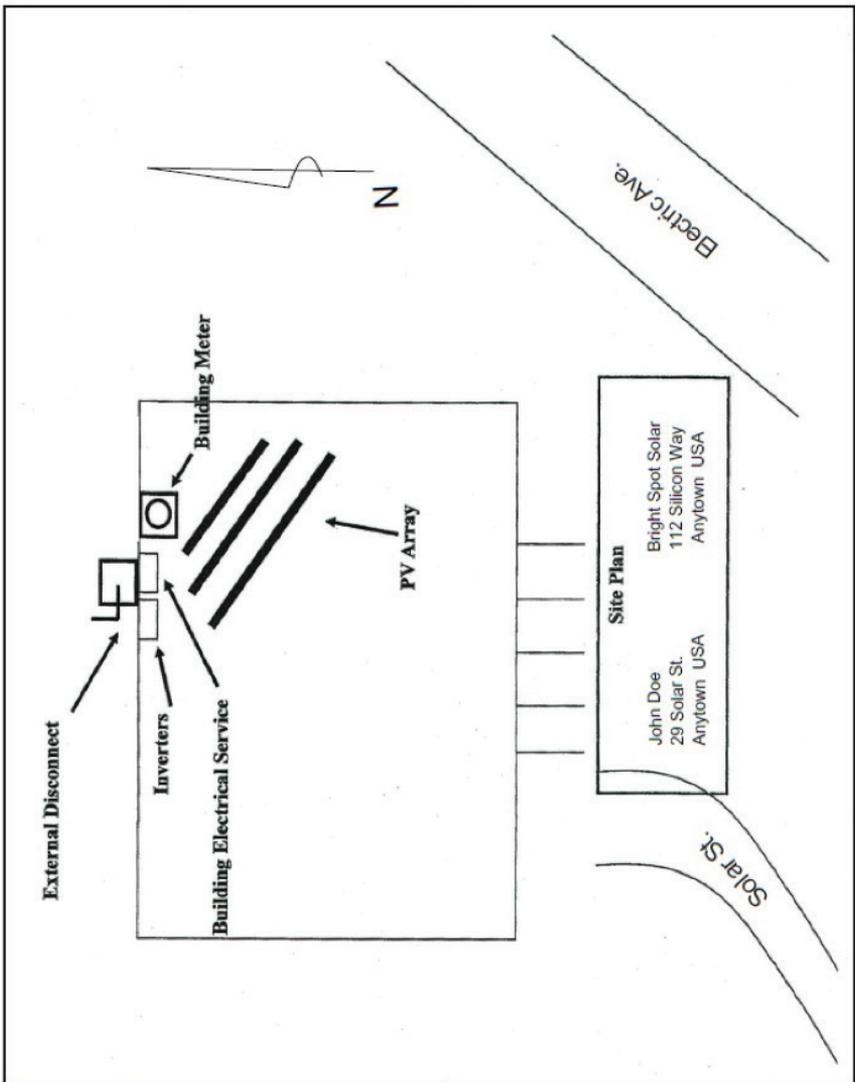
PV System Size	Minimum Liability Insurance Coverage
Category 1 ( $\leq 20$ kW)	\$300,000
Category 2 ( $> 20$ kW and $\leq 200$ kW)	\$1,000,000*
Category 3 ( $> 200$ kW and $\leq 1$ MW)	\$2,000,000*
Category 4 ( $> 1$ MW and $\leq 15$ MW)	\$Negotiated*

\*MGE must also be named an additional insured party in the customer's liability insurance policy.

## What should be included on the site plan?

- Location of interconnection disconnect switch
- Adjoining street name
- Street address for the exact location of the distributed generation facility
- Location of major equipment
- Electric service entrance
- MGE electric meter
- Interface equipment

\*See page 5 for an example of a site plan.



\*Site plan example

### Step 3 - MGE reviews the Distributed Generation Application Form

MGE will review the application and notify the applicant if it is complete or more information is needed within 10 working days.

Once the application is complete, MGE mails the applicant a Distributed Generation Interconnection Agreement Form 6029 or 6030, copy of the accepted application, insurance documents, site plan, one-line schematic and rate information.

MGE will also communicate the engineering review costs. The application fee will be applied to the engineering review costs. Information on review times and fees are in the chart below.

PV System Size	Engineering Review	
	Time Limit*	Fee
Category 1 ( $\leq 20$ kW)	10 days	none
Category 2 ( $> 20$ kW and $\leq 200$ kW)	15 days	$\leq \$500$
Category 3 ( $> 200$ kW and $\leq 1$ MW)	20 days	Cost based**
Category 4 ( $> 1$ MW and $\leq 15$ MW)	40 days	Cost based**

\*Time limit is working days

\*\*MGE staff time and/or external professional services

### Step 4 - MGE performs engineering review

Applicant must give written permission and send payment before MGE starts the engineering review. MGE will then perform the engineering review within 10 to 40 days, depending on PV system size.

MGE will review the application to determine if interconnecting a PV system could affect the electric distribution system. For example, the interconnection may cause equipment loading concerns or system protection issues. The engineering review may uncover potential issues that warrant a distribution study. If needed, MGE will notify the applicant that a distribution system study is required and provide a written cost estimate.

Applicant must provide written permission and pay costs up front.

PV System Size	Distribution System Study	
	Time Limit*	Fee
Category 1 ( $\leq 20$ kW)	10 days	none
Category 2 ( $> 20$ kW and $\leq 200$ kW)	15 days	$\leq \$500$
Category 3 ( $> 200$ kW and $\leq 1$ MW)	20 days	Cost based**
Category 4 ( $> 1$ MW and $\leq 15$ MW)	60 days	Cost based**

\*Time limit is working days

\*\*MGE staff time and/or external professional services

## Step 5 - MGE conducts a distribution system study

After the applicant authorizes MGE in writing to proceed and provides payment, MGE will perform the distribution system study. The study must be completed within 10 to 60 days, depending on PV system size. The purpose is to further analyze potential issues identified during the engineering review. The distribution system study will determine whether distribution system modifications are needed to accommodate the proposed PV system.



## **Step 6 - MGE notifies applicant of distribution system study results**

MGE will notify applicant of the distribution system study results. If modifications to the electric distribution system are needed, MGE will provide a written cost estimate. Modifications may include, but are not limited to, replacing smaller MGE high-voltage wires with larger wires; replacing distribution transformers at the point of interconnection with the customer; modifying MGE's system protection schemes; or installing telemetry equipment to monitor the status of the PV system.

Applicant must agree in writing to pay for the modifications, and the payment must be made before work begins.

## **Step 7 - MGE completes electric distribution system modifications**

MGE completes electric distribution system modifications and notifies applicant in writing when the work is done.

## **Step 8 - Installer completes PV system installation**

You may now complete the PV system installation. After the installation is complete, call the electrical inspector. You should also call MGE at 608-252-7373 (press 1) or send an email to [scheduling@mge.com](mailto:scheduling@mge.com) to schedule an appointment for system testing. Keep in mind that MGE will not schedule testing until we receive the electrical permit.

## Step 9 - MGE witnesses system testing

MGE will witness the system testing (commissioning). During commissioning, MGE may:

- Perform an anti-islanding test.
- Verify protective equipment.
- Review metering requirements and make changes if necessary.

Customers will not be charged for MGE's employee time.

After system testing is complete, MGE will review the results and notify the applicant if the system meets specifications within 5 to 10 working days, depending on PV system size. For approved interconnections, MGE will inform the applicant in writing and provide cost reconciliation. If interconnection is not approved, the applicant may take corrective action and ask MGE to review again.





## **Step 10 - Sign interconnection agreement**

MGE and the applicant sign the Distributed Generation Interconnection Agreement Form 6029 for PV systems under 20 kW. For systems greater than 20 kW and less than 15 MW, Distributed Generation Interconnection Agreement Form 6030 will be signed.

MGE then interconnects the PV system to the electric distribution system.

MGE will mail a copy of the fully executed interconnection agreement to the applicant, and a copy to the installer.

## MGE Parallel Generation rates

If customers want to interconnect a PV system to the electric distribution system and sell electricity back to MGE, customers have two rate options.

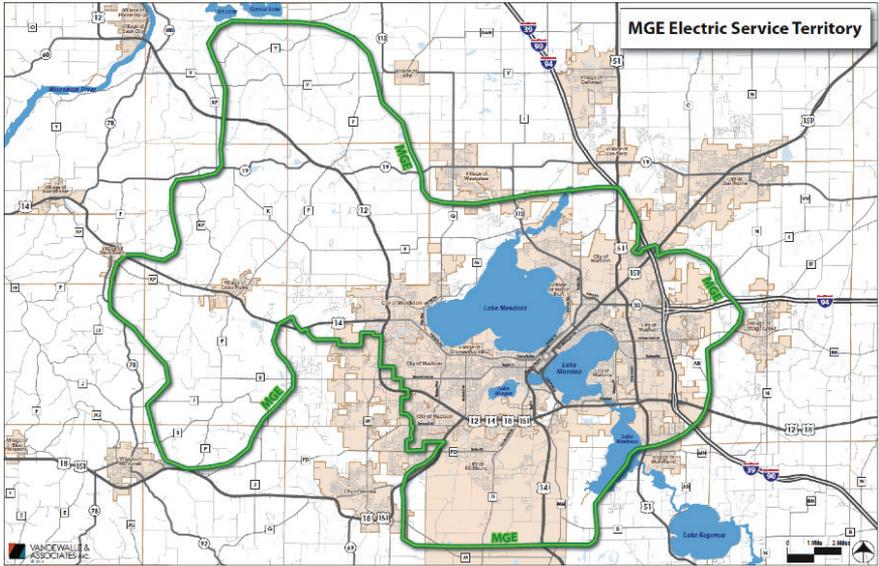
- PG-1 - Parallel Generation
  - For interconnected PV systems of any size
- PG-2 - Parallel Generation: Net Metering
  - For interconnected PV systems up to 100 kW (default rate)
  - Net metering is a rate option that credits the customer's MGE bill at the appropriate retail rate for any excess electricity generated from the PV system that flows back onto the electric distribution system. If over the most recent 12-month period the amount of electricity from a PV system sent to the electric distribution system exceeded the amount of electricity used, the customer is a net seller to the electric distribution system. Net sellers are credited at a different rate (Pg-1).

For more information, call Laura McFadden at 608-252-5654.

# The area we serve

## MGE's Electric Service Territory

MGE serves 146,000 electric customer's in Dane County, including the communities of Cross Plains, Fitchburg, Madison, Maple Bluff, McFarland, Middleton, Monona and Shorewood Hills.



## **listening. learning.**

MGE takes responsibility to provide information and education to serve our customers and stakeholders. We educate customers today to help inform their decision making. We educate tomorrow's stakeholders so they can help plan our energy future.

Bring MGE into the planning process early on to keep your projects running smoothly. *Working together we can make a difference.*

Call MGE and ask for a business account manager or visit our website for information about energy and more. We provide the technical, financial and educational services you need to stay competitive.

- [mge.com/business](http://mge.com/business)
- 608-252-7222
- 1-800-245-1125

 printed on recycled paper



**your community energy company**