

WIDRC Interconnection Forum



1

March 23, 2017



Agenda



2

- Distributed generation application overview
- Insurance Requirements
- Engineering review and distribution study
- System testing and interconnection
- Q&A

Renewable Distributed Generation (DG)



3

- Renewable DG interconnected with MGE's grid
 - 23.6 MW customer-owned DG (460 projects)
 - 5 MW customer-owned photovoltaic (PV) (451 projects)

Distributed Generation Application Overview and Requirements

PSC 119 - How Did We Get Here?



5

- What's behind Utility's process and interconnection rules?
- Push to create statewide interconnection rules
 - Rules are the same for all utilities
- Uniform standards help ensure the safety and reliability of the grid
- Public Service Commission of Wisconsin published Wisconsin Administrative Code Chapter PSC 119

Contact Your Utility



6


- Call Utility first!
- Utility's Engineering Department can begin reviewing the electric distribution system early in the planning process
- Utility may also meet you on-site to discuss the plan and project timelines before work begins



Required Forms <20 kW



- Distributed Generation Application Form 6027




Standard Distributed Generation Application Form(Generation 20 kW or less)
Public Service Commission of Wisconsin
P.O. Box 7854
Madison, WI 53707-7854

6027 (12/01/05)

Distributed By	Supplied By
Name and Address	Name and Address
	Public Service Commission of Wisconsin P. O. Box 7854 Madison, WI 53707-7854

- Distributed Generation Interconnection Agreement Form 602



Distributed Generation Interconnection Agreement (20 kW or less)
Public Service Commission of Wisconsin
P.O. Box 7854
Madison, WI 53707-7854

6029 (9/19/11) *****SUBMIT COMPLETED AGREEMENT DIRECTLY TO YOUR ELECTRIC PROVIDER*****
(This completed agreement should NOT be sent to the Public Service Commission)

Electric Service Distributed By	Form Supplied By
Name and Address	Name and Address
	Public Service Commission of Wisconsin P. O. Box 7854 Madison, WI 53707-7854

Required Forms 20 kW – 15 MW



8

- Distributed Generation Application Form 6028
— Available for download at Utility.com/interconnection



6028 (9/19/11)

Distributed Generation Application Form (Generation of Greater than 20 kW to 15 MW)

Public Service Commission of Wisconsin

P.O. Box 7854

Madison, WI 53707-7854

*****SUBMIT COMPLETED FORM DIRECTLY TO YOUR ELECTRIC PROVIDER*****

(This completed form should **NOT** be sent to the Public Service Commission)

- Distributed Generation Interconnection Agreement Form 6030



6030 (9/19/11)

Distributed Generation Interconnection Agreement (20 kW to 15 MW)

Public Service Commission of Wisconsin

P.O. Box 7854

Madison, WI 53707-7854

*****SUBMIT COMPLETED AGREEMENT DIRECTLY TO YOUR ELECTRIC PROVIDER*****

(This completed agreement should **NOT** be sent to the Public Service Commission)

Application Time Limits and Fees

9

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

* Time limit is based on working days

Application Attachments



10

- Proof of liability insurance coverage
- One-line schematic diagram
- Control schematics
- Site plan
- Application review fee

Insurance Requirements



11

- Important for applicant to address insurance requirements early in the process
- PSC 119 Form 6030 (20 kW – 15 MW) requires the public utility be named as an additional insured on an applicant's commercial general liability insurance policy
 - Provides the public utility limited protections and coverage under the applicant's policy
- Utility works directly with the applicant and applicant's insurance broker to satisfy this requirement

Insurance Requirements



12

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

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

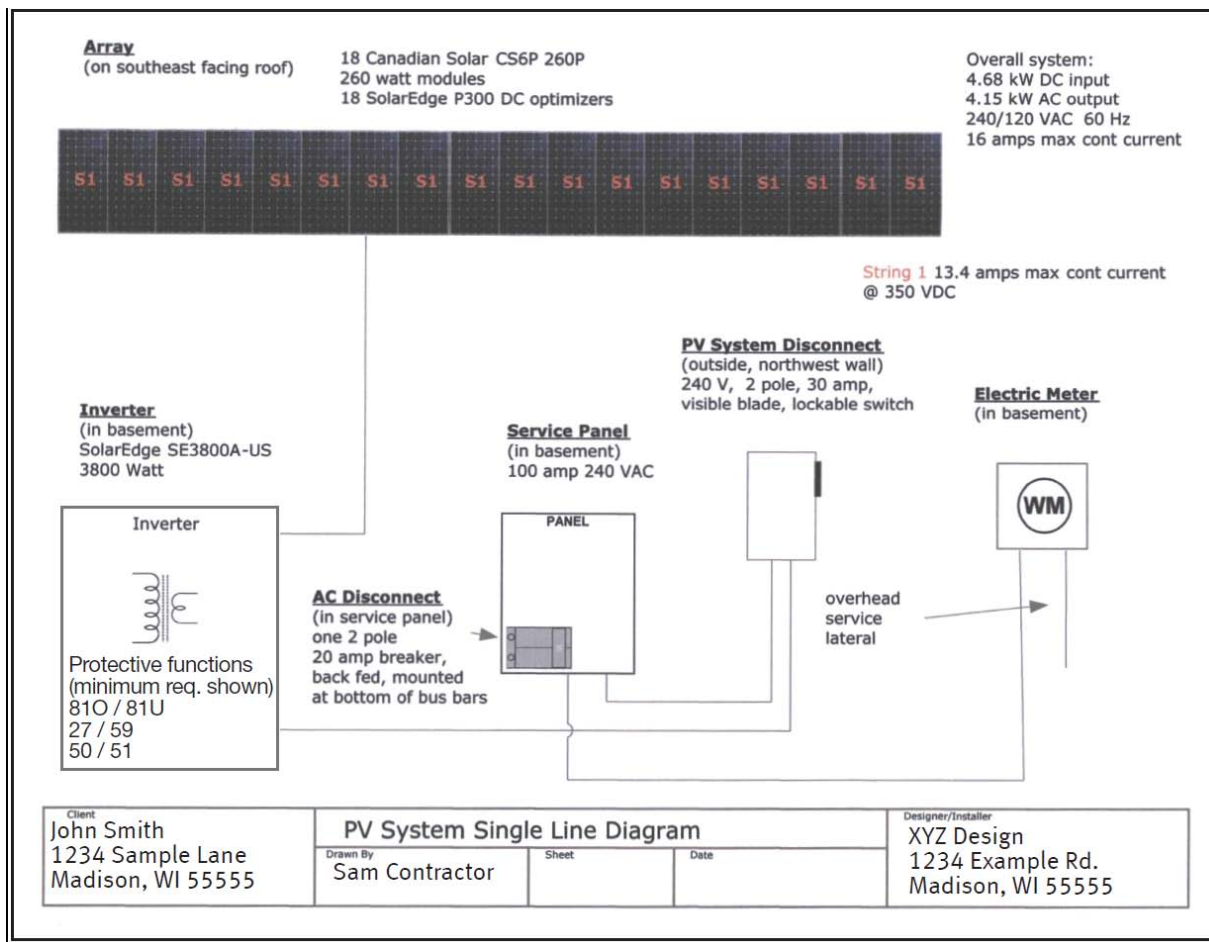
One-Line Schematic



13

- Generator or inverter
- Point of DG connection to customer's electrical system
- Point of common coupling
- Lockable interconnection disconnect switch
- Method of grounding (generator and transformer ground connections)
- Protection functions and systems

Sample One-Line Schematic Diagram



Control Schematics



15

Protective functions and controls for:

- Generator protection
- Distribution system protection

Site Plan



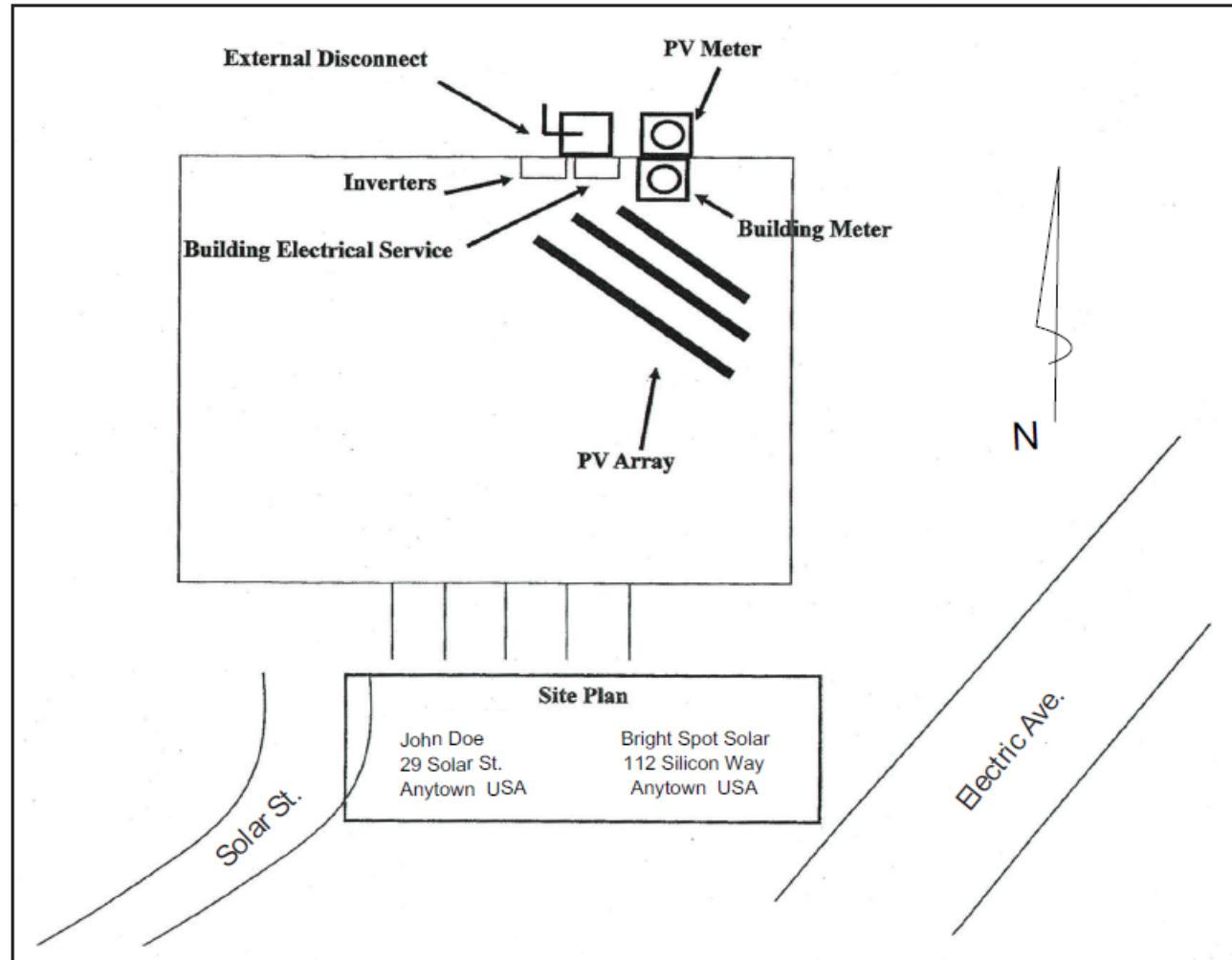
17

- Location of interconnection disconnect switch
- Adjoining street name
- Street address of DG facility
- Location of major equipment
- Electric service entrance
- Utility electric meter
- Interface equipment

Sample Site Plan



18



Application Review



19

- Utility reviews application
 - Within 10 working days, notify applicant if complete or more information is needed
- If application is complete, Utility mails the applicant:
 - Distributed Generation Interconnection Agreement Form 6030
 - Parallel generation rate information
 - Insurance requirements

Engineering Review, Distribution Study, Testing, and Interconnection

Engineering Review



21

- Review application to determine if the interconnection could affect the grid
 - Loading concerns
 - System protection issues
- May uncover potential issues that warrant a distribution study

Engineering Review



- Utility notifies applicant of engineering review costs
- Applicant gives written permission to proceed
- Applicant pays for engineering review costs
- Utility performs engineering review within 15 to 40 days

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

*Time limit is working days

** Utility staff time and/or outside professional services

Distribution Study



23

- Further analyze potential problems identified during the engineering review
- Will determine whether distribution system modifications are needed

Distribution Study



- Utility notifies applicant that distribution study is required and provides written cost estimate
- Applicant must provide written permission and pay costs up front
- Utility performs distribution study within 15 to 60 days

PV System Size	Distribution System Study	
	Time Limit*	Fee
Category 2 (> 20 kW and ≤ 200 kW)	15 days	≤ \$500
Category 3 (> 200 kW and ≤ 1 MW)	20 days	Cost based**
Category 4 (> 1 MW and ≤ 15 MW)	60 days	Cost based**

*Time limit is working days

** Utility staff time and/or outside professional services

Distribution Study Findings



25

- Utility notifies applicant of study findings, provides copy of results
- If modifications are needed, Utility provides cost estimate to applicant
- Applicant agrees in writing to pay for distribution system modification costs
- Applicant must pay modification costs before work begins

Distribution Modifications



26

- Modifications may include:
 - Replacing smaller Utility high-voltage wires with larger wires
 - Replacing distribution transformers at the point of interconnection
 - Modifying Utility's system protection schemes
 - Installing telemetry equipment to monitor the status of the DG system
- Utility completes distribution system modifications
- Utility notifies applicant

Install DG System



27

- Complete DG installation
- Notify electrical inspector
- Call Utility to schedule system testing
- Utility will not schedule testing until we receive the electrical permit



System Testing



28

- Utility witnesses system testing (commissioning)
- During commissioning, Utility may:
 - Verify protective equipment
 - Perform an anti-islanding test

System Testing



29

- After system testing is complete, Utility will:
 - Notify applicant within 5 to 10 working days of its approval or disapproval of the interconnection
 - If approved, notify applicant in writing and include cost reconciliation
 - If interconnection is not approved, the applicant can take corrective action and ask Utility to review again

Interconnection Agreement



30

- Utility and applicant sign Distributed Generation Interconnection Agreement
- Utility interconnects the system
- Utility mails a copy of the fully executed interconnection agreement to the applicant and the installer is copied
- Project is complete!

Q&A



31

