

**Interconnection Guidelines, Application and Agreement  
for  
Parallel Installation and Operation  
of  
Distributed Generation Facilities**



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Interconnection Applicant Name

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## Part 1. INTERCONNECTION GUIDELINES

### 1. PURPOSE:

The purpose of this document is to set forth the terms and conditions for Customer-sited distributed generation equipment to interconnect and operate in parallel with the Maquoketa Municipal Electric Utility Distribution System.

### 2. DEFINITIONS:

- a. **Applicable Laws and Regulations** – All duly promulgated applicable federal, state and local laws, regulations, rules, ordinances, codes, decrees, judgments, directives, or judicial or administrative orders, permits and other duly authorized actions of any Governmental Authority.
- b. **Customer** – Any entity interconnected to the Utility's Distribution System for the purpose of receiving retail electric power service from the Utility's Distribution System.
- c. **Customer Generator** – The owner or operator of a Distributed Generation Facility which:
  - i. is powered by a renewable energy resource;
  - ii. is located on a premises owned, operated, leased or otherwise controlled by the Customer;
  - iii. is interconnected and operates in parallel phase and synchronization with the Utility Distribution System and is in compliance with the terms, conditions, and technical requirements established by the Utility;
  - iv. is intended primarily to offset part or all of the Customer's own electrical energy requirements;
  - v. contains a mechanism, approved by the Utility, that automatically disables the unit and interrupts the flow of electricity back onto the Utility's electric Distribution System in the event that service to the Customer Generator is interrupted.
- d. **Distributed Generation Facility** – For purposes of this standard, the Customer's device for the conversion of energy to electricity, as identified in the Interconnection Application.
- e. **Distribution System** – The Utility's facilities and equipment used to deliver electricity to homes and industries.
- f. **Force Majeure** – A Force Majeure event shall mean "any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control." A Force Majeure event does not include an act of negligence or intentional wrongdoing.
- g. **Good Utility Practice** – Any of the practices, methods and acts engaged in or approved by a significant portion of the electric industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was

made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

- h. **Governmental Authority** – Any federal, state, local or other governmental regulatory or administrative agency, court, commission, department, board, or other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that such term does not include the Customer or any affiliate thereof.
- i. **Interconnection Application** – The Customer's request to interconnect a new Distributed Generation Facility, or to increase the capacity of, or make a material modification to the operating characteristics of, an existing Distributed Generation Facility that is interconnected with the Utility's electrical system.
- j. **Interconnection Standard** – Any reference to Interconnection Standard shall mean all the provisions, forms and related documents described in the collective parts of this document, the Interconnection Standards for Parallel Installation and Operation of Distributed Generation Facilities.
- k. **Qualifying Facility** – A cogeneration facility or a small power production facility that is a qualifying facility under 18 CFR Part 292, Subpart B, used by a Customer to generate electricity that operates in parallel with the Distribution System. Qualifying Facilities that are not wind and solar may qualify for interconnection with the Utility under provisions of the Public Utilities Regulatory Policies Act (PURPA), but the terms and conditions of interconnection shall be determined on a case-by-case basis.
- l. **Reasonable Efforts** – With respect to an action required to be attempted or taken by a Party under the Interconnection Agreement, efforts that are timely and consistent with Good Utility Practice and are otherwise substantially equivalent to those a Party would use to protect its own interests.
- m. **System Upgrades** – The additions, modifications, and upgrades to the Distribution System at or beyond the point of interconnection to facilitate interconnection of the Distributed Generation Facility and render the transmission service necessary to effect the Customer's wholesale sale of electricity in interstate commerce. System Upgrades do not include interconnection equipment.

### 3. **ELIGIBILITY:**

- a. Interconnection to the Distribution System shall be granted only to new or existing Customers, in good standing, under the Utility's electric service schedules. The Interconnection Agreement shall be between the Customer and the Utility and will not include third parties.

b. The Interconnection Standards apply to a Distributed Generation Facility with a rated output of up to 100 kilowatts (kW<sub>AC</sub>). Proposals to interconnect customer-owned distributed generation with output rated at more than 100 kW<sub>AC</sub> or Qualifying Facility not covered by this standard will be subject to a review process that may take into account the impact of the interconnection on reliability, rates, power supply agreements, and local and regional system planning.

**4. REQUEST:**

The Customer shall make a request by completing the attached document entitled "Application for Interconnection" and the associated fee. The Utility may require additional details or clarifications as needed to properly evaluate the application.

**5. SYSTEM EFFECTS:**

The Utility will analyze the overall impact of the proposed generating facility on the Distribution System. Such analyses will be based on Good Utility Practice to determine thermal effects, voltage ranges, power quality, system stability, etc.

**6. SYSTEM UPGRADES:**

As a result of the above analysis, the Utility will provide the Customer with a cost estimate and projected timeframe for any System Upgrades that may be necessary to accommodate the Distributed Generation Facility.

**7. AGREEMENT:**

Once the Customer and the Utility have identified and mutually agreed on the scope of the interconnection project including the Distributed Generation Facility, System Upgrades and estimated costs, the Customer and the Utility shall execute the attached document entitled "Interconnection Agreement."

**8. CODES AND PERMITS:**

- a. The Customer shall be responsible for procuring all building, operating and environmental permits that are required by any Governmental Authority having jurisdiction for the type of Distributed Generation Facility and for the necessary ancillary structures to be installed.
- b. All Distributed Generation Facilities and interconnection equipment shall meet the standards listed in the attached document entitled "National Certification Codes and Standards."
- c. All construction and facilities shall meet all applicable building and electrical codes.

**9. CERTIFICATE OF COMPLETION:**

Upon completion of the Distributed Generation Facility and prior to normal operation, the Customer shall provide a signed copy of the attached document entitled "Certificate of Completion."

**10. NORMAL OPERATION:**

The Customer may begin normal operation of the Distributed Generation Facility upon completion of all documentation and receipt of written approval from the Utility.

## **Part 2. TECHNICAL REQUIREMENTS**

### **1. CHARACTER OF SERVICE:**

The electrical service shall be 60 cycle per second alternating current (AC) at supply voltages and number of phases that apply under the Utility's rate schedules.

### **2. CODE REQUIREMENTS:**

The Distributed Generation Facility shall meet all requirements established by the National Electrical Code (NEC), National Electrical Safety Code (NESC), Institute of Electrical and Electronics Engineers (IEEE), Underwriters Laboratories (UL), and Occupational Safety and Health Administration. Specific codes are listed in Section 7 of this Part 2, below as "National Certification Codes and Standards." In addition, Manufacturer's Ownership, Operating and Maintenance Manuals shall be reviewed and accepted by both parties prior to beginning operation.

### **3. DISTRIBUTED GENERATION FACILITY CONTROL AND OPERATION:**

The control system of the Distributed Generation Facility shall comply with the IEEE specifications and standards for parallel operation with the Utility and in particular as follows:

- a. Power output control system shall automatically disconnect from Utility source upon loss of Utility voltage and not reconnect until Utility voltage has been restored by the Utility.
- b. Power output control system shall automatically disconnect from Utility source if Utility voltage fluctuates beyond plus or minus 10% (ten percent).
- c. Power output control system shall automatically disconnect from Utility if frequency fluctuates plus or minus 2 cycles (Hertz).
- d. Inverter output distortion shall meet IEEE requirements.
- e. The Distributed Generation Facility shall meet the applicable IEEE standards concerning impacts to the Distribution System with regard to harmonic distortion, voltage flicker, power factor, direct current injection and electromagnetic interference.

### **4. FAULT CURRENT CONTRIBUTION**

The Distributed Generation Facility shall be equipped with protective equipment designed to automatically disconnect during fault current conditions and remain disconnected until the voltage and frequency have stabilized.

### **5. RECLOSING COORDINATION**

The Distributed Generation Facility shall be coordinated with the Distribution System reclosing devices by disconnecting from the Distribution System during the initial de-energized operation and shall remain disconnected until the Distribution System voltage and frequency have stabilized.

### **6. DISCONNECT DEVICE:**

A safety disconnect switch shall be installed that is visible to and readily accessible by Utility personnel. The switch shall be capable of being locked in the open

position and shall prevent the Distributed Generation Facility from supplying power to the Distribution System. The disconnect device shall be physically located for ease of access by the Utility personnel.

**7. STANDARDS FOR INTERCONNECTION, SAFETY, AND OPERATING RELIABILITY**

The interconnection of a Distributed Generation Facility and associated interconnection equipment to the Utility's Distribution System shall meet the applicable provisions of the following publications:

- a. ANSI/IEEE1547-2003 Standard for Interconnecting Distributed Resources with Electric Power Systems (including use of IEEE 1547.1 testing protocols to establish conformity). The following standards shall be used as guidance in applying IEEE 1547:
  - i. IEEE Std 519-2014, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
  - ii. IEC/TR3 61000-3-7 Assessment of emission limits for fluctuating loads in MV and HV power systems
- b. Iowa Electric Safety Code, as defined in 199 IAC Chapter 25
- c. ANSI/NFPA 70 (2014), National Electrical Code
- d. OSHA (29 CFR § 1910.269)

### Part 3. Interconnection Application

This application for Interconnection of Distributed Generation Facilities is considered complete when it provides all applicable and correct information required below. Additional information or clarification to evaluate the Application may be requested by the Utility.

#### Application Fee

For Distributed Generation Facilities with a rated output of 25 kW<sub>AC</sub> or less, a non-refundable processing fee of \$100 must accompany this Interconnection Application.

For Distributed Generation Facilities with a rated output greater than 25 kW<sub>AC</sub> and up to 100 kW<sub>AC</sub>, a non-refundable fee of \$200 must accompany this Interconnection Application.

For Distributed Generation Facilities with a rated output greater than 100 kW<sub>AC</sub>, a non-refundable fee of \$500 must accompany this Interconnection Application. Upon receiving a standard application form, the Utility shall specify the amount of any additional engineering review or distribution system study fees. Application fees shall be credited toward the cost of any engineering review or distribution system study. The applicant shall pay the fees unless the public utility chooses to waive the fees in whole or in part.

#### INTERCONNECTION APPLICANT CONTACT INFORMATION

Owner/Customer Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_  
Utility Account Number: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

#### ALTERNATE CONTACT INFORMATION (IF DIFFERENT FROM INTERCONNECTION APPLICANT)

Owner/Customer Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_  
Utility Account Number: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

#### INSTALLING CONTRACTOR

Name & Company: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_  
License No: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_



At Maquoketa Municipal Electric Utility, we join forces with other local not-for-profit utilities through WPPI Energy to share resources and lower costs.

Shared strength through  WPPI Energy

## DISTRIBUTED GENERATION FACILITY INFORMATION

Interconnection Address: \_\_\_\_\_

Inverter Manufacturer: \_\_\_\_\_

Model: \_\_\_\_\_ Quantity: \_\_\_\_\_

PV Panel Manufacturer: \_\_\_\_\_

Model: \_\_\_\_\_ Quantity: \_\_\_\_\_

Wind Manufacturer: \_\_\_\_\_

Model: \_\_\_\_\_ Quantity: \_\_\_\_\_

Total Nameplate Ratings: \_\_\_\_\_ kW<sub>DC</sub> (if PV Panels) \_\_\_\_\_ kVA \_\_\_\_\_ Volts<sub>AC</sub>

Is the Distributed Generation Facility equipment UL1741 Listed? Yes No

If Yes, please attach manufacturer's cut-sheet showing UL1741 listing.

Estimated Installation Date: \_\_\_\_\_ Estimated Commissioning Test Date: \_\_\_\_\_

List components of the Distributed Generation Facility equipment package that are currently certified:

Equipment Type	Certifying Entity
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____

**Attach a one line diagram.** The one line diagram is a basic drawing of an electric circuit in which one or more conductors are represented by a single line and each electrical device and major component of the installation, from the generator to the point of interconnection and including the disconnect switch, are noted by symbols.

**Attach a plot plan diagram.** A plot plan diagram is a map or sketch showing the Distributed Generation Facility's location in relation to streets, building structures, electric service equipment or other geographic markers.

## CUSTOMER SIGNATURE

I hereby certify that, to the best of my knowledge, the information provided in this Interconnection Application is true. I agree to abide by the terms, conditions, and technical requirements of the Utility's Interconnection Standard and will return the Certificate of Completion when the Distributed Generation Facility has been installed.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## UTILITY USE

Contingent Approval to Interconnect the Distributed Generation Facility

Interconnection of the Distributed Generation Facility is approved contingent upon the terms, conditions, and technical requirements of the Utility's Interconnection Standard and upon return of the Certificate of Completion.

Utility Signature: \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_

Utility waives inspection/witness test? Yes No Initial \_\_\_\_\_

## **Part 4. INTERCONNECTION AGREEMENT**

This Agreement, ("**Agreement**") is entered into by and between Maquoketa Municipal Electric Utility ("**Utility**") and \_\_\_\_\_, ("**Customer**"). Customer and Utility are referenced in this Agreement collectively as "**Parties**" and individually as "**Party.**"

### **Recitals**

WHEREAS, Utility is a municipal electric utility engaged in the retail sale of electricity in the state of Iowa;

WHEREAS, Customer owns or desires to install, own and operate an electric Distributed Generation Facility;

### **Agreement**

NOW, THEREFORE, in consideration of the covenants and promises herein, the Parties mutually agree as follows:

1. SCOPE OF AGREEMENT

This Agreement governs the terms and conditions under which the Customer's Distributed Generation Facility will interconnect with and operate in parallel with the Utility's electrical Distribution System.

2. DEFINITIONS:

The definitions used in this Part are those found in Part 1, Section 2 of this Interconnection Standard.

3. PARALLEL OPERATION

Customer shall not commence parallel operation of the Distributed Generation Facility until written approval of the interconnection facilities has been given by Utility. Such approval shall not be unreasonably withheld. Utility shall have the right to have representatives present at the initial testing of Customer's protective apparatus.

4. INTERCONNECTION COSTS

The Utility has estimated the costs, including overheads, for the purchase and construction of necessary System Upgrades to its Distribution System and has provided a detailed itemization of such costs in the attached description of the estimated System Upgrade costs. The Customer agrees to pay the costs upon receipt of the Utility's invoice within the timeframe indicated on the invoice.

5. INTERRUPTION OR REDUCTION OF DELIVERIES

Utility may require Customer to interrupt or reduce deliveries when the Utility determines, in its sole discretion, that curtailment, interruption or reduction is

necessary because of personnel safety, emergencies, Force Majeure or compliance with Good Utility Practices.

6. ADVERSE OPERATING EFFECTS

The interconnection of the Distributed Generation Facility shall not reduce the reliability and quality of the Distribution System. This includes, but is not limited to high levels of harmonics, abnormal voltage fluctuations and excessive frequency deviations. The Utility shall notify the Customer as soon as practicable if, based on Good Utility Practice, operation of the Distributed Generation Facility may cause disruption or deterioration of service to other customers served from the same electric system, or if operating the Distributed Generation Facility could cause damage to the Utility's Distribution System. If, after notice, the Customer fails to remedy the adverse operating effect within a reasonable time, the Utility may disconnect the Distributed Generation Facility. The Utility shall provide the Customer with notice of such disconnection as provided in the Utility's Service Policies.

7. ACCESS TO PREMISES

Utility shall have access to the Customer's premises or property as permitted in the Service Policies.

8. INSURANCE & INDEMNITY

The Customer shall, at its own expense, agree to insure and indemnify the Utility and its representatives against liability for any injuries or damages caused by the operation of the customer's equipment or by any failure of the customer to maintain such equipment in satisfactory or safe operating condition. Failure to maintain required insurance and proof of financial responsibility shall be cause for disconnection. The amount of such insurance shall be not less than the following amounts based on the system rating:

Generation Capacity	Minimum Liability Insurance Coverage
25 kW <sub>AC</sub> or less	\$300,000
Greater than 25 kW <sub>AC</sub> to 100 kW <sub>AC</sub>	\$1,000,000
Greater than 100 kW <sub>AC</sub>	\$2,000,000

9. GOVERNING LAW

This Agreement shall be interpreted and governed under the laws of the State of Iowa. Venue of any action arising hereunder or related to this Agreement shall lie in Jackson County, Iowa.

10. DOCUMENTS

This Agreement incorporates all other provisions and related documents of this Interconnection Standard.

11. NOTICES

All written notices shall be directed as follows:

CUSTOMER:	MAQUOKETA MUNICIPAL
Name: _____	ELECTRIC UTILITY:
Address: _____	General Manager
City/State/Zip _____	201 E. Pleasant St.
	Maquoketa, IA 52060

12. TERM OF AGREEMENT

This Agreement shall be in effect when signed by the Customer and Utility and shall remain in effect thereafter month to month unless terminated by either Party on thirty (30) days prior written notice and in accordance with the Service Policies. If at any time during the term of this Agreement, modifications are needed to the Distributed Generation Facility or the Distributed Generation Facility has a change of ownership, the Customer shall notify the Utility immediately and a new Interconnection Application and Agreement may be required.

IN WITNESS WHEREOF, the Parties hereto have caused two originals of this Interconnection Agreement to be executed by their duly authorized representatives.

This Agreement is effective as of the last date set forth below.

CUSTOMER:

For the UTILITY:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name and Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

# Part 5. Certificate of Completion

When installation of the Distributed Generation Facility is complete and final electric inspector approval has been obtained, submit this completed form to Maquoketa Municipal Electric Utility, 201 E. Pleasant St., Maquoketa, IA 52060.

Interconnection Applicant Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_

Email Address: \_\_\_\_\_

Location of the Generating Facility (if different from above):  
\_\_\_\_\_

## DISTRIBUTED GENERATION FACILITY INSTALLER

Name and Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_

License Number: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

## INSPECTION

Is the Generating Facility installed, tested and ready for operation?      Yes      No

Commission Test Date: \_\_\_\_\_

The Distributed Generation Facility has been installed and inspected in compliance with applicable electrical codes.

A copy of the signed electrical inspection form is attached.      Yes      No  
(If inspection form is not attached)

Signature of inspector: \_\_\_\_\_

Printed name of inspector: \_\_\_\_\_

Date: \_\_\_\_\_



At Maquoketa Municipal Electric Utility, we join forces with other local not-for-profit utilities through WPPI Energy to share resources and lower costs.

Shared strength through  WPPI Energy

**Part 6. APPROVAL TO ENERGIZE DISTRIBUTED GENERATION FACILITY**

Maquoketa Municipal Electric Utility, having entered into an Interconnection Agreement for the Distributed Generation Facility described in the Interconnection Application submitted by \_\_\_\_\_ and having received a Certificate of Completion with proper documentation of the electrical inspection hereby authorizes the Distributed Generation Facility to be energized:

Utility Signature: \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_