# Interconnection Standards for Parallel Installation and Operation of Customer-Owned Renewable Electric Generating Facilities West Point Municipal Utility System

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Applicant Name:	
Application Number:	The state of the s

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#### Part 1. OVERVIEW

#### 1. PURPOSE:

The purpose of this document is to establish standards for the Utility to interconnect and operate in parallel with customer-owned renewable electric generators.

#### 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. Avoided Costs The incremental costs to the Utility of electric energy or capacity or both which, but for the purchase from the Customer's Generating Facility, the Utility would generate itself or purchase from another source.
- c. 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.
- d. Customer Generator The owner or operator of a Generating 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 Generator;
  - iii. is interconnected and operates in parallel phase and synchronization with an affected utility and is in compliance with the standards established by the affected utility;
  - iv. is intended primarily to offset part or all of the Customer Generator'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 supplier's electricity lines in the event that service to the Customer Generator is interrupted.
- e. Distribution System The Utility's facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries directly from nearby generators or from interchanges with higher voltage transmission networks which transport bulk power over longer distances.
- 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. Generating Facility For purposes of this Standard, the Customer's device for the conversion of wind or solar energy to electricity, as identified in the Interconnection Application.
- h. 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.

- i. 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.
- j. Interconnection Application The Customer's request to interconnect a new Generating Facility, or to increase the capacity of, or make a material modification to the operating characteristics of, an existing Generating Facility that is interconnected with the Utility's electrical system.
- k. 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 Customer-Owned Renewable Electric Generating Facilities, as of the date adopted and and printed on the cover page.
- Net Metering A bi-directional metering process using equipment sufficient to measure the
  difference between the electrical energy supplied by a Customer Generator to the Utility's
  Distribution System and the electrical energy supplied by the Customer Generator to the
  Utility and over an applicable billing period.
- m. 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 an interconnection customer to generate electricity that operates in parallel with the electric distribution system or local electric power system. Qualifying Facilities that are not Generating Facilities under subparagraphs "g" above 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.
- n. 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.
- o. System Average Energy Cost The current average cost of fuel and purchased energy for the billing period as determined by the Utility.
- p. System Upgrades The additions, modifications, and upgrades to the Utility's Distribution System at or beyond the point of interconnection to facilitate interconnection of the

Generating Facility and render the transmission service necessary to effect the Interconnection Customer's wholesale sale of electricity in interstate commerce. Distribution Upgrades do not include Interconnection Facilities.

#### 3. ELIGIBILITY:

- a. Interconnection to the electric 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 customer-owned Generating Facility with a rated output of 50 kilowatts (kW) or fewer and/or not to exceed 50% of previous years usage. Proposals to interconnect a customer-owned generator with output rated at more than 50 kW 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". 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 transmission and 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 generating facility.

#### 7. AGREEMENT:

Once the Customer and the Utility have identified and mutually agreed on the scope of the overall project including the generating 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 generating facility and for the necessary ancillary structures to be installed.
- b. The equipment shall meet the standards listed in the attached document entitled "National Certification Codes and Standards".
- c. The construction and facilities shall meet all applicable building and electrical codes.

#### NET METERING:

The Customer shall complete the necessary net metering service schedule documentation to permit the bi-directional flow of electricity and the financial treatment of the net deliveries.

#### 10. CERTIFICATE OF COMPLETION:

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

## 11. NORMAL OPERATION:

The Customer may begin normal operation of the generating 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 Generating 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.

## GENERATING FACILITY CONTROL AND OPERATION:

The control system of the Generating 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 Generating 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 Generating 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.

#### RECLOSING COORDINATION

The Generating Facility shall be coordinated with the Distribution System reclosing devices by disconnecting from the system during the initial de-energized operation and shall remain disconnected until the 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 generator from supplying power to the distribution system.

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

The interconnection of a Customer-Owned Generating Facility and associated interconnection equipment to the Utility's Distribution Facilities 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 1574:
  - i. IEEE Std 519-1992, 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 (2008), National Electrical Code
- d. OSHA (29 CFR § 1910,269)

#### Part 3. NET METERING FOR CUSTOMERS' RENEWABLE GENERATION

#### 1. PURPOSE:

The provisions of this policy set forth the terms and conditions under which a customer may be compensated for net deliveries of energy and/or capacity to the Utility from Customer Generators with Renewable Energy Resources approved by the Utility.

#### 2. DEFINITIONS:

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

#### NET METERING GENERAL PROVISIONS:

- a. The Utility shall offer Net Metering to its Customers that wish to generate electricity on the Customer's side of the meter using only renewable resources for energy sources.
- b. Net Metering is intended for Customer Generators with a rated output of 50 kilowatts (KW) or fewer produced through conversion of wind or solar energy.
- c. The Utility shall make Net Metering available to eligible Customer Generators within its service area on a first-come, first-served basis. The maximum total rated capacity in kW of customer generation that will be allowed on the Utility's system shall be limited to not more than 2% of the Utility's peak demand (50% of the Customers demand prior to the installation of the generating facilities) during the previous Annualized Period. Interconnection of Generating Facilities in excess of this system limit shall be evaluated on a case-by-case basis
- d. Customer Generators shall be equipped with properly approved Utility metering equipment that can measure the flow of electricity in both directions at the same rate, typically through use of a single bi-directional meter. Necessary metering will be supplied and installed by the Utility.
- e. Whenever the amount of electricity delivered by an eligible Customer Generator in a billing period exceeds the electricity supplied by the Utility in such billing period, the Utility shall settle with the Customer Generator for the excess kilowatt-hours (kWh) in accordance with the billing practices described in this policy.
- f. If a Customer Generator formally terminates Net Metering, the Utility shall treat the end of the service period as if it were the end of the billing period and, if applicable, settle with the Customer Generator according to the appropriate billing practices.
- g. The Utility shall provide Net Metering at non-discriminatory rates that are identical with respect to the applicable customer rate class, retail rate components, and any monthly charges, to the rates that a customer would be charged if not a Customer Generator.
- h. The Utility shall not charge a Customer Generator any fee or charge, or require additional equipment or any other requirement, unless the fee, charge, or other requirement is specifically authorized under the terms of the Interconnection Agreement, this Policy or if the fee, charge or other requirement would apply to other customers that are not Customer Generators. Any insurance coverage that may be required is specifically exempted from this paragraph.

i. Nothing in this Policy shall abrogate any Customer's obligation to comply with all applicable Federal, State, or local laws, codes, or ordinances; nor with the Service Rules and Policies of the Utility.

#### 4. INTERCONNECTION STANDARDS

To qualify for Net Metering, Customer Generators must comply with the Utility's Interconnections Standards for Parallel Installation and Operation of Customer-Owned Electric Generating Facilities.

#### 5. REQUEST

The Customer Generator shall make a request for Net Metering by completing the Utility's Application for Net Metering and the Utility's Application for Interconnection. The Utility may require additional details or clarifications as needed to properly evaluate the application.

#### 6. BILLING PRACTICES

The following net billing provisions shall apply to net consumption of energy by a Customer whose Generating Facility is eligible for Interconnection under Part 1, Section 3 of this Standard and has received Approval to Energize under Part 7 of this Standard.

#### Net Metering Credit – Financial Credit

- a. Positive Net Consumption. Whenever the amount of electricity delivered by an eligible Customer Generator in a billing period is <u>less</u> than the electricity delivered by the Utility during such billing period, after any offset from credited kilowatt-hours carried forward from prior billing periods, billing for the net energy supplied by the Utility will be made in accordance with the rate schedule applicable to the Customer's assigned rate class and all applicable riders.
- b. Negative Net Consumption. Whenever the amount of electricity delivered by an eligible Customer Generator in a billing period is <u>more</u> than the electricity supplied by the Utility in a billing period, the Utility shall credit the Customer Generator for the excess kilowatt-hours for use in subsequent billing periods. The excess kilowatt-hours will be credited to the Customer Generator's account on a monetary basis of the "Avoided Cost". The avoided cost credit will be calculated based on the annualized wholesale purchase cost of power.
- c. Obligation for Other Charges. Regardless of whether the Customer Generator is entitled to receive financial credit for excess electrical energy from a prior billing period, Customer Generators remain responsible for all charges incurred during each billing period including, but not limited to: customer charges, facilities charges, demand charges, environmental charges, transmission charges, any late payment charges, and any requirements for deposits or special charges or fees that may be applied.
- d. Annual Financial Settlement. Any net excess generation credit remaining in a Customer Generator's account at the end of each Calendar Year, shall be paid to the customer at the "Avoided Cost". Shall be zeroed at the end of the fiscal year (December 31<sup>st</sup>).

## Part 4. INTERCONNECTION & NET METERING APPLICATION

Application	No.	

## West Point Municipal Electric

This Application for Interconnection and net metering of customer-owned renewable generation 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.

Processing Fee		
For systems with a rated output of 10 laccompany this Application.	kW or fewer, a non-refundable	processing fee of \$100 must
For systems with a rated output greate accompany this Application.	er than 10 kW and up to 50 kW,	a non-refundable fee of \$250 must
Customer		
Name:		
Address:		
City:	State:	Zip:
Telephone (Day):	(Evening):	
Fax:	E-Mail Address:	
Contact (if different from Customer)		
Name:		
Address:		
City:	State:	Zip:
Telephone (Day):	(Evening):	
Fax:	E-Mail Address:	A AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Owner of the facility:		
Generating Facility Information		
Location (if different from above):		
Inverter Manufacturer:		
Model		
Nameplate Rating: (kW)	(kVA)	

System Design Capacity: (kW) (kVA)
Energy Source: Solar  Wind Other (describe)
Is the equipment UL1741 Listed?
If Yes, attach manufacturer's cut-sheet showing UL1741 listing
Estimated Installation Date: Estimated In-Service Date:
List components of the Small Generating Facility equipment package that are currently certified:
Equipment Type Certifying Entity
1
2
3
4
Customer Signature  I hereby certify that, to the best of my knowledge, the information provided in this Application is true. I agree to abide by the terms and conditions of the Utility's Interconnection Standard and will return the Certificate of Completion when the Generating Facility has been installed.
Signature: Date:
Contingent Approval to Interconnect the Generating Facility
nterconnection of the Generating Facility is approved contingent upon the terms and conditions of the Jtility's Interconnection Standard and upon return of the Certificate of Completion.
Jtility Signature:
itle: Date:
application Number:
Itility waives inspection/witness test?

## Part 5. INTERCONNECTION AND NET METERING AGREEMENT

	Application No
	West Point Municipal Electric
	This Agreement, ("Agreement") is entered into by and between West Point Municipal Electric ("Utility)
	("Customer"). Customer and Utility are referenced in this Agreement
collectiv	ely as "Parties" and individually as "Party."
	Recitals
WH	IEREAS, Utility is a municipal electric utility engaged in the retail sale of electricity in the state of lowa;
WH	IEREAS, Customer owns or desires to install, own and operate an electric Generating Facility;
	Agreement
NO'	W, 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 Generating Facility will interconnect with and operate in parallel with the Utility's electrical 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 generating 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.

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#### 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.

#### ADVERSE OPERATING EFFECTS

The interconnection of the customer-owned generation 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 Generating Facility may cause disruption or deterioration of service to other customers served from the same electric system, or if operating the Generating 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 Generating 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

The Customer shall, at its own expense, maintain in force general liability insurance without any exclusion for liabilities related to the interconnection undertaken pursuant to this Agreement. The amount of such insurance shall be not less than \$100,000 combined single limit.

#### 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 Lee 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:	UTILITY:
Name:	West Point Municipal Utility
Address:	313 5 <sup>th</sup> Street
City/State/Zip	West Point, Iowa 52656

#### 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.

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

This Agreement is effective as of the last date set forth below. For the UTILITY: CUSTOMER: Signature Signature Print Name and Title Print Name Date

5,3

Date

# Part 6. CERTIFICATE OF COMPLETION

West Point Municipal Utility	
Is the Generating Facility installed, tested and read	ly for operation? Yes No
Customer:	
Address:	
Telephone (Day):	
Fax:	E-Mail Address:
Location of the Generating Facility (if different from	•
Electrician/Service Company:	_
Name:	_
Address:	_
City/State/ZIP:	
Telephone (Day):	(Evening):
Fax:	E-Mail Address:
License number:	
Date Utility approved installation facility:	_
Application number:	
Inspection:	
The Generating Facility has been installed and inspe	ected in compliance with applicable electrical codes.
A copy of the signed electrical inspection form is att (If inspection form is not attached)	tached. 🗖 Yes 🗖 No
Signature of inspector:	Date
Inspection: The Generating Facility has been installed and inspe A copy of the signed electrical inspection form is att  (If inspection form is not attached)	tached. QYes QNo

Printed name of inspector

Application No. \_\_\_\_\_

# Part 7. APPROVAL TO ENERGIZE GENERATING FACILITY

	Application No
noted by number above and having rec	connection Agreement for the facility described in the Application eived a Certificate of Completion with proper documentation of the the Generating Facility to be energized:
Jtility Signature:	
Fitle:	Date:

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