Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less

City of Marshall Electric Department

Adopted February 7, 2022

Contents

PART 1. OVERVIEW

1. PURPOSE:

The purpose of this document is to establish standards for eligible customers ("Customer") to interconnect and operate Customer-Owned inverter-based solar and wind Generation Facilities with a rated output of 30 kilowatts Alternating Current (kW_{AC}) or less in parallel with the City of Marshall ("City") Electric Distribution System.

2. DEFINITIONS:

a. **AC** – Alternating Current

b. **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, including ordinances and resolutions of Marshall City Council and City Electric Department Standard Rules and Regulations.

c. **City** – The City of Marshall, Michigan.

d. **Commercial Operation Date** – The date on which the Generation Facility is operating and is in compliance with the requirements of these Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less as determined by the City.

e. **Customer** – a Residential or Commercial electric customer interconnected to the Electric Distribution System for the purpose of receiving retail electric service that also owns and operates an approved Generation Facility.

f. **DC** – Direct Current

g. **Electric Distribution System** – The City facilities and equipment used to provide electric service to customers, including the Customer.

h. **Electric Utility** – The City of Marshall Electric Department.

i. **Generation Facility** – For purposes of these Interconnection Standards, the Customer device for conversion of wind energy or solar energy to electricity, as identified in the Interconnection Application, that:

   1. is an inverter-based wind or solar energy facility with a rated capacity/output of 30 kW_{AC} or less;

   2. is owned by the Customer;

   3. is located on the Customer's premises;

   4. serves only the Customer's premises (serves no other customers)

   5. is interconnected with and operates in parallel phase and synchronization with the Electric Distribution System and is in compliance with these Interconnection Standards;

6. is intended primarily to offset part or all of the Customer's own electrical energy requirements;

7. contains a City-approved mechanism(s) that automatically disconnects the Generation Facility and interrupts the flow of electricity to the Electric Distribution System in the event that electric service to the Customer is interrupted.

8. meets all of the following generating capacity limitations:

   a. Generator annual energy production shall not exceed Customer's annual energy requirements.

   b. For demand-metered customers, generator capacity/output in kW_{AC} shall not exceed Customer's average monthly demand for the previous 12-month period, or 30 kW, whichever is less.

   c. Total capacity of all Customer-Owned Generation Facilities shall not exceed one percent (1%) of the previous year Electric Utility system peak demand. No Generation Facility shall be interconnected that would cause total Customer-Owned Generation Facility capacity connected to the Electric Distribution System to exceed one percent (1%) of the previous year Electric Utility System peak demand.

j. **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.

k. **Harmonic Distortion** – Distortion of the normal AC sine wave typically caused by non-linear loads or inverters.

l. **Interconnection** – The physical connection of a Generation Facility to the City Electric Distribution System.

m. **Interconnection Application** – The Customer request to interconnect a new Generation Facility, or to increase the capacity of, or make a material modification to the operating characteristics of an existing Generation Facility that is interconnected with the Electric Distribution System.

n. **Interconnection Standards** – Interconnection Standards shall mean all provisions, forms and related documents described in the collective parts of these Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less, or successor document.

o. **Metering Point** – The electric meter shown on the one-line diagram accompanying the Interconnection Application.

p. **Party** – Individually the City and the Customer; collectively the "Parties."

q. **Prudent Utility Practice** – Any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility 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. Prudent 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 by the electric utility industry in the region.

r. **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 Prudent Utility Practice and are otherwise substantially equivalent to those a Party would use to protect its own interests.

s. **System Upgrades** – Additions, modifications, improvements, and upgrades to the Electric Distribution System or Customer service connection at or beyond the point of interconnection to facilitate interconnection of the Customer Generation Facility.

t. **Voltage Flicker** – A variation of voltage sufficient in duration to allow visual observation of a change in electric light source intensity.

3. ELIGIBILITY:

a. Must be a Residential or Commercial electric customer with a Customer-Owned inverter-based wind or solar energy Generation Facility as defined herein that is interconnected behind the meter (connected to the customer side of the electric meter or meters) and single-phase or three-phase service at 60 Hertz at a nominal voltage of 120/240 volts, 208 volts or 480 volts furnished through a single bidirectional electric meter or meters capable of recording the flow of electricity in each direction or multiple meters. Specific metering shall be at the City's discretion.

b. Customer's utility account must be in good standing and in compliance with City electric rate schedules and Electric Department Standard Rules and Regulations.

c. A Generation Facility that does not meet all of the requirements of Section 2i. above, including capacity limitations, is not eligible to interconnect with the Electric Distribution System under these Interconnection Standards. Such facilities are subject to separate negotiation with the City.

4. INTERCONNECTION REQUEST:

The Customer shall request interconnection of a Generation Facility by completing and submitting to the Electric Utility the attached document entitled "Interconnection Application." The Electric Utility may require additional information or clarification to

evaluate the Customer Interconnection Request. Interconnection Applications will be reviewed by the Electric Utility in the order in which they are received. If an Interconnection Application is viewed as incomplete, the Electric Utility will provide notice to the Customer that the Application is not complete, provide a description of the information needed to complete the Application and include a statement that processing of the Application cannot begin until the Application is complete.

5. ELECTRIC DISTRIBUTION SYSTEM IMPACT ANALYSIS:

After receiving a properly completed Interconnection Application, the Electric Utility will analyze the potential impact of the Generation Facility on the Electric Distribution System and on other Electric Utility customers. Such analyses will be based on Prudent Utility Practice to determine thermal effects, voltage ranges, power quality, system stability, etc., and will include the following:

a. The Customer Generation Facility's proposed interconnection point is on a radial distribution circuit and not a transmission line.
b. The proposed Generation Facility complies with IEEE 1547 and UL 1741 standards.
c. The proposed Generation Facility's capacity in aggregation with other generation on the circuit shall not exceed 15 percent (15%) of the total circuit peak demand (kW) as most recently measured at the substation during the previous 12-month period; nor shall it exceed 15 percent (15%) of a distribution circuit line section annual peak demand (kW).
d. The proposed Generation Facility, in aggregation with other generation on the distribution circuit, shall not contribute more than 10 percent (10%) to the distribution circuit's maximum fault current at the point on the primary voltage distribution line nearest the proposed interconnection point.
e. The proposed Generation Facility, in aggregation with other Customer-Owned Generation Facilities connected to the distribution circuit, may not cause any distribution protective devices and equipment (including substation breakers, fuse cutouts, and line reclosers, or other customer equipment on the electric distribution system to be exposed to fault currents exceeding 85 percent (85%) of the short circuit interrupting capability.
f. No additional Generation Facilities shall be interconnected on a circuit that already exceeds 85 percent (85%) of its short circuit interrupting capability.
g. No Generation Facility shall be interconnected that would cause the total interconnected Customer-Owned Generating Facility capacity to exceed one percent (1%) of the previous year Electric Utility system peak demand.
h. When a proposed Generation Facility is single-phase and is to be interconnected on a center tap neutral on a 240-volt service, its addition shall not create an imbalance between the two sides of the 240-volt service of more than 20 percent of the nameplate rating of the service transformer.
i. The proposed Generation Facility installation must be certified to pass an applicable non-islanding test or use reverse power relays or other means to meet IEEE 1547 unintentional islanding requirements.

j. On a three-phase, three-wire primary electric distribution line, a three-phase or single-phase generator shall be connected phase-to-phase.
k. When the Applicant's facility is to be connected to three-phase, four-wire primary distribution lines, a three-phase or single-phase generator shall be connected line-to-neutral and shall be effectively grounded.
l. A review of the type of electrical service provided to the Customer, including line configuration, and the transformer connection, shall be conducted to limit the potential for creating over-voltage on the Electric Distribution System due to a loss of ground during the operation time of any anti-islanding function.
m. When the proposed Generation Facility is to be interconnected on a single-phase shared secondary line, the aggregate generation capacity on the shared secondary line, including the proposed Generation Facility, shall not exceed ten kilowatts (10 kW).

Feasibility Analysis

If the proposed Generation Facility fails to meet one or more of the above requirements, the Customer may request the Electric Utility to complete an analysis to determine the feasibility of interconnecting the proposed Generation Facility to the Electric Distribution System. The Feasibility Analysis shall include:

1. Initial identification of any circuit breaker short-circuit capability limits exceeded as a result of the interconnection.
2. Initial identification of any thermal overload or voltage limit violations resulting from the interconnection.
3. Initial review of grounding requirements and system protection.
4. A description and nonbinding estimated cost of facilities required, in the Electric Utility's sole determination, to interconnect the Generation Facility to the Electric Distribution System in a safe and reliable manner.

The actual cost of the Feasibility Analysis shall be paid by the Customer. The Electric Utility will provide an estimated cost of the Feasibility Analysis to Customer. Customer shall advance 50% of such estimate to Electric Utility if Customer requests the Electric Utility to prepare the Feasibility Analysis. When Feasibility Analysis cost exceeds 50% of the estimated cost, Electric Utility shall bill Customer as such fees are incurred.

System Impact Study

If the Feasibility Analysis concludes that interconnection of the proposed Generation Facility would create an adverse system impact, a System Impact Study is required.

A System Impact Study shall evaluate the impact of the proposed Generation Facility interconnection on the safety and reliability of the Electric Distribution system. The study shall:

1. Identify and detail the system impacts that result if the proposed Generation Facility is interconnected without project or system modifications.
2. Consider the adverse system impacts or potential impacts identified in the Feasibility Analysis.
3. Consider all Generating Facilities that, on the date the System Impact Study is commenced, are directly interconnected with the Electric Distribution System.
4. Consider pending Interconnection Applications of Generation Facilities requesting interconnection to the Electric Distribution System.

The System Impact Study shall consider the following criteria:

1. A load flow study.
2. A short circuit analysis.
3. A stability analysis.
4. Voltage drop and flicker studies.
5. Protection and set point coordination studies.
6. Grounding reviews.

The City shall state the underlying assumptions of the Study and show the results of the analyses to the Customer, including the following:

1. Any potential impediments to providing the requested interconnection service.
2. Any required Electric Distribution System Upgrades and the estimated cost and time to engineer and construct said System Upgrades.

The actual cost of the System Impact Study shall be paid by the Customer. The Electric Utility will provide an estimated cost of the System Impact Study to Customer and Customer shall advance 50% of such estimate to Electric Utility if Customer requests the Electric Utility to prepare the System Impact Study. When System Impact Study cost exceeds 50% of the estimated cost, Electric Utility shall bill Customer as such fees are incurred.

6. SYSTEM UPGRADES:

The City shall not be obligated to make upgrades or improvements to its Electric Distribution System to accommodate the Customer's Generation Facility. Where System Upgrades are required prior to interconnection of the Generation Facility as identified in the Feasibility Study and/or System Impact Study, the City will provide the Customer with an estimated schedule and the Customer's cost for said System Upgrades.

7. INTERCONNECTION AGREEMENT:

After the Customer and the City have identified and mutually agreed on the project scope including the Generation Facility, System Upgrades and estimated costs (if any), the Customer and the City shall execute the attached document entitled "Interconnection Agreement." The Interconnection Agreement shall be between the City and the Customer

and shall not include third parties. Prior to commencement of System Upgrades required to allow interconnection of the Customer-Owned Generation Facility, Customer shall deposit with the Electric Utility an amount equal to the estimated cost of said System Upgrades. See "Section 4. Interconnection Costs" of the Interconnection Agreement for additional information.

8. CODES AND PERMITS:

a. The Customer shall be responsible for procuring all building, operating, environmental or other permits for the Generation Facility and for the necessary ancillary structures to be installed that are required by any Governmental Authority having jurisdiction.

b. The Generation Facility and interconnecting equipment shall meet the requirements listed in "Part 2. Technical Requirements" of these Interconnection Standards.

c. The construction and facilities shall meet all applicable building and electrical codes.

9. CERTIFICATE OF COMPLETION:

Upon completion of the Generation Facility and prior to the Commercial Operation Date of said Facility, the Customer shall complete and submit a signed copy of the attached document entitled "Certificate of Completion."

10. NORMAL OPERATION:

The Customer may begin Commercial Operation of the Generation Facility upon receipt of written approval from the Electric Utility.

PART 2. TECHNICAL REQUIREMENTS

1. CHARACTER OF SERVICE:

The electric service shall be 60 cycles per second (60 Hertz) alternating current (AC) at supply voltages and number of phases under the Residential or Commercial electric rate schedule that would apply if the Customer did not have an interconnected Generation Facility.

2. CODE REQUIREMENTS:

The 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 the Occupational Safety and Health Administration. Specific applicable codes are shown in Section 7 of this Part 2 below as "Standards for Interconnection, Safety and Operating Reliability." In addition, manufacturer's ownership, operating and maintenance manuals or documents shall be provided to the Electric Utility with the Customer Interconnection Application. The Electric Utility shall review said manuals or documents as part of the Interconnection Application review process.

3. GENERATION FACILITY CONTROL:

The control system of the Generation Facility shall comply with IEEE and UL specifications and standards for parallel operation with the Electric Distribution System and in particular as follows:

a. Power output control system shall automatically disconnect from the Electric Distribution System upon loss of System voltage and shall not reconnect until System voltage has been restored by the Electric Utility.

b. Power output control system shall automatically disconnect from the Electric Distribution System if System voltage fluctuates beyond plus or minus ten percent (10%).

c. Power output control system shall automatically disconnect from the Electric Distribution System if frequency fluctuates plus or minus two cycles (2 Hertz).

d. Inverter output Harmonic Distortion shall meet IEEE and UL standards.

e. The Generation Facility shall meet applicable IEEE and UL standards concerning impacts to the Electric Distribution System with regard to Harmonic Distortion, Voltage Flicker, power factor, direct current injection and electromagnetic interference.

4. FAULT CURRENT DISCONNECTION:

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

5. RECLOSING COORDINATION:

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

6. EXTERIOR GENERATOR AC DISCONNECT SWITCH:

The Customer shall install a Generator Alternating Current (AC) Disconnect Switch on the exterior of the premises served within six (6) feet of the Electric Utility electric meter or service entrance. Said exterior Generator AC Disconnect Switch shall be visible and readily accessible to Electric Utility representatives at all times. This switch shall be clearly labeled as "Generator AC Disconnect Switch." The switch shall be capable of being locked in an open position and shall prevent the Generation Facility from supplying power to the Electric Distribution System while in the open position.

7. STANDARDS FOR INTERCONNECTION, SAFETY AND OPERATING RELIABILITY:

The interconnection of a Generation Facility and associated equipment to the Electric Distribution System shall meet the applicable provisions of the following publications or successor standards:

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:

   1. IEEE Standard 519-1992, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

   2. IEC/TR3 61000-3-7 Assessment of emission limits for fluctuating loads in MV and HV power systems

b. UL 1741 Standard for Inverters, Converters and Controllers for Use in Independent Power Systems

c. ANSI/NFPA 70 (2008), National Electrical Code

d. OSHA (29 CFR § 1910.269)

e. IEEE Standard 929-2000, *IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems*

f. IEEE Standard C37.90.1-1989 (R1994), *IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems*

g. IEEE Standard C37.90.2 (1995), *IEEE Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers*

h. IEEE Standard C62.41.2-2002, *IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits*

i. IEEE Standard C62.45-1992 (R2002), *IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000V and Less) AC Power Circuits*

j. ANSI C84.1-1995 *Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)*

8. ACCESS AND INSPECTION BY ELECTRIC UTILITY:

Customer shall provide the Electric Utility reasonable opportunity to inspect the Generation Facility prior to its interconnection and Commercial Operation Date and to witness initial testing and commissioning of the Generation Facility. The Electric Utility may witness any commissioning tests required by IEEE 1547/UL 1741.

Following initial testing and inspection of the Generation Facility and upon reasonable advance notice to Customer, the Electric Utility shall have access at reasonable times to the Generation Facility to perform on-site inspections to verify that the installation, maintenance and operation of the Generation Facility complies with the requirements of these Interconnection Standards. The Electric Utility cost of such inspection(s) shall be at the Electric Utility's expense; however, the Electric Utility shall not be responsible for any other cost Customer may incur as a result of such inspection(s). Upon written request, Customer shall inform the Electric Utility of the next scheduled maintenance and allow the Electric Utility to witness the maintenance program and any associated testing.

The Electric Utility shall at all times have immediate access to the exterior Generator AC Disconnect Switch to isolate the Generation Facility from the Electric Distribution System.

9. GENERATION FACILITY OPERATION:

a. Customer shall install, operate, and maintain, at Customer's sole cost and expense, the Generation Facility in accordance with the manufacturer's suggested practices for safe, efficient and reliable operation of the Generation Facility in parallel with the Electric Distribution System. Customer shall bear full responsibility for the installation, maintenance and safe operation of the Generation Facility. Upon request from the Electric Utility, Customer shall supply copies of periodic test reports or inspection logs.

b. Customer shall be responsible for protecting, at Customer's sole cost and expense, the Generation Facility from any condition or disturbance on the Electric Distribution System, including, but not limited to, voltage sags or swells, system faults, outages, loss of a single phase of supply, equipment failures, and lightning or switching surges.

c. Customer agrees that, without prior written permission from the Electric Utility, no changes shall be made to the configuration of the Generation Facility as approved by the Electric Utility, and no relay or other control or protection settings shall be set, reset, adjusted or tampered with, except to the extent necessary to verify that the Generation Facility complies with City-approved settings.

d. Customer shall operate the Generation Facility in such a manner as not to cause undue voltage fluctuations, power quality issues, intermittent load characteristics or to

otherwise interfere with the operation of the Electric Distribution System. At all times when the Generation Facility is operated in parallel with the Electric Distribution System, Customer shall operate said Generation Facility in such a manner that no disturbance will be produced thereby to the service rendered by the Electric Utility to any of its other customers or to any electric system interconnected with the Electric Distribution System. Customer understands and agrees that the interconnection and operation of the Generation Facility pursuant to these Interconnection Standards is secondary to, and shall not reduce the safety, quality, or reliability of electric service provided by the Electric Utility.

e. Customer's control equipment for the Generation Facility shall immediately, completely, and automatically disconnect and isolate the Generation Facility from the Electric Distribution System in the event of a fault on the Electric Distribution System, a fault on Customer's electric system, or loss of a source or sources on the Electric Distribution System. The automatic disconnecting device included in such control equipment shall not be capable of reclosing until after service is restored on the Electric Distribution System. Additionally, if the fault is on Customer's electric system, such automatic disconnecting device shall not be reclosed until after the fault is isolated from the Customer's electric system.

10. RIGHT TO DISCONNECT GENERATION FACILITY:

The Electric Utility shall have the right and authority to disconnect and isolate the Generation Facility without notice at the Electric Utility's sole discretion if the Electric Utility believes that any of the following has occurred or is occurring:

a. Electric service to Customer's premises is discontinued for any reason.

b. Adverse electrical effects (such as power quality problems) on the Electric Distribution System and/or the electrical equipment of other Electric Utility customers attributed to the Generation Facility as determined by the Electric Utility.

c. Electric Distribution System emergencies or maintenance requirements.

d. Hazardous conditions existing on the Electric Distribution System as a result of the operation of the Generation Facility or protective equipment.

e. Failure of the Customer to maintain required insurance and to provide the Electric Utility with proof of insurance within ten (10) days of request. Electric Utility shall be named as an additional "insured" on said insurance policy.

f. Electric Utility identification of uninspected or unapproved equipment or modifications to the Generation Facility after initial approval.

g. Recurring abnormal operation, substandard operation or inadequate maintenance of the Generation Facility.

h. In non-emergency situations, the Electric Utility shall give Customer notice of noncompliance including a description of the specific noncompliance condition and

allow Customer a reasonable time to cure the noncompliance prior to disconnecting and isolating the Generation Facility.

i. In the event that the Electric Utility disconnects the Generation Facility for routine maintenance, the Electric Utility shall make reasonable efforts to reconnect the Generation Facility as soon as practicable.

j. The Customer retains the option to temporarily disconnect the Generation Facility from the Electric Distribution System at any time. Such temporary disconnection shall not constitute termination of the Interconnection Agreement unless the Customer exercises its termination rights under Section 14.

11. RATES AND OTHER CHARGES:

a. Customer must participate in the Electric Utility's Renewable Energy Net Metering Program as a condition of interconnecting a Customer-Owned Generating Facility.

b. Customer must complete and submit to the Electric Utility the Renewable Energy Net Metering Rider-Application for Service in Part 7. The Electric Utility shall not approve a Customer-Owned Generation Facility Interconnection Application that does not include a completed Net Metering Rider-Application for Service.

c. Terms and conditions of service under the Renewable Energy Net Metering Program are contained in the Renewable Energy Net Metering Rider.

12. INSURANCE:

Customer shall maintain reasonable amounts of insurance coverage against risks related to the Generation Facility for which there is a reasonable likelihood of occurrence. Customer shall agree to provide the Electric Utility with proof of such insurance upon the Electric Utility's request. The Electric Utility's receipt of evidence of insurance coverage does not imply an endorsement of the terms and conditions of said coverage. Electric Utility shall be named as an additional "insured" on said policy.

13. LIMITATION OF LIABILITY AND INDEMNIFICATION:

Customer agrees to assume all liability for and shall indemnify the Electric Utility for any claims, losses, costs, and expenses of any kind or character to the extent that they result from the design, construction, operation or maintenance of the Generation Facility. Such indemnity shall include, but is not limited to, financial responsibility for: (a) the Electric Utility's monetary losses; (b) reasonable costs and expenses of defending an action or claim made by a third party; (c) damages related to the death or injury of a third party; (d) damages to the property of the Electric Utility; (e) damages to the property of a third party; (f) damages for the disruption of the business of a third party. This paragraph does not create a liability on the part of the Customer to the Electric Utility or a third party, but requires indemnification where such liability exists. The limitations of liability provided in this paragraph do not apply in cases of gross negligence or intentional wrongdoing.

14. EFFECTIVE TERM AND TERMINATION RIGHTS:

The Interconnection Agreement shall become effective when executed by both Parties and shall continue in effect until terminated in accordance with the provisions of this Section. The Interconnection Agreement may be terminated for the following reasons:

a. Electric service to Customer's premises is discontinued for any reason. If electric service is disconnected for any reason or a change occurs in the account holder, a new Interconnection Application must be submitted to the City for consideration;

b. Customer may terminate the Interconnection Agreement at any time by giving the Electric Utility at least sixty (60) days' prior written notice stating Customer's intent to terminate the Agreement at the expiration of such notice period;

c. the Electric Utility may terminate the Agreement at any time following Customer's failure to generate energy from the Generation Facility in parallel with the Electric Distribution System by the later of two (2) years from the date of execution of the Interconnection Agreement or after any twelve- (12-) month period following completion of the interconnection provided for by the Agreement;

d. either Party may terminate the Interconnection Agreement at any time by giving the other Party at least sixty (60) days' prior written notice that the other Party is in default of any of the material terms and conditions of the Interconnection Agreement or these Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less, so long as the notice specifies the basis for termination and there is reasonable opportunity for the Party in default to cure the default; or

e. the Electric Utility may terminate the Interconnection Agreement at any time by giving Customer at least sixty (60) days' prior written notice in the event that there is a change in an applicable rule or statute affecting the Agreement.

Upon termination of the Interconnection Agreement, Customer's Generation Facility shall be permanently disconnected from the Electric Distribution System.

Termination of the Interconnection Agreement shall not relieve either party of its liabilities and obligations, owed or continuing at the time of said termination.

15. TERMINATION OF ANY APPLICABLE PRIOR AGREEMENT:

From and after the date when service commences under the Interconnection Agreement, the Agreement shall supersede any oral and/or written agreement or understanding between the Electric Utility and Customer concerning the interconnection service covered by the Agreement. Any such prior agreement or understanding shall be deemed to be terminated as of the date interconnection service commences under the Interconnection Agreement.

16. FORCE MAJEURE:

For purposes of the Interconnection Agreement, the term "Force Majeure" means any cause or event not reasonably within the control of the Party claiming Force Majeure, including,

but not limited to, the following: acts of God, strikes, lockouts, or other industrial disturbances; acts of public enemies; orders or permits or the absence of the necessary orders or permits of any kind which have been properly applied for from the government of the United States, the State of Ohio, any political subdivision or municipal subdivision or any of their departments, agencies or officials, or any civil or military authority; unavailability of a fuel or resource used in connection with the generation of electricity; extraordinary delay in transportation; unforeseen soil conditions; equipment, material, supplies, labor or machinery shortages; epidemics; landslides; lightning; earthquakes; fires; hurricanes; tornadoes; storms; floods; washouts; drought; arrest; war; civil disturbances; explosions; breakage or accident to machinery, transmission lines, pipes or canals; partial or entire failure of utilities; breach of contract by any supplier, contractor, subcontractor, laborer or materialman; sabotage; injunction; blight; famine; blockade; or quarantine. A Force Majeure event does not include an act of negligence or intentional wrongdoing.

If either Party is rendered wholly or partly unable to perform its obligations under the Interconnection Agreement because of Force Majeure, both Parties shall be excused from whatever obligations under the Agreement are affected by the Force Majeure (other than the obligation to pay money) and shall not be liable or responsible for any delay in the performance of, or the inability to perform, any such obligations for so long as the Force Majeure continues. The Party suffering an occurrence of Force Majeure shall, as soon as is reasonably possible after such occurrence, give the other Party written notice describing the particulars of the occurrence and shall use reasonable efforts to remedy its inability to perform; provided, however, that the settlement of any strike, walkout, lockout or other labor dispute shall be entirely within the discretion of the Party involved in such labor dispute.

PART 3. INTERCONNECTION APPLICATION

Application No. _____

City of Marshall Electric Department
Customer-Owned Renewable Electric Generation Facility 30 kW_{AC} or Less

This Application for Interconnection of a Customer-Owned Renewable Electric Generation Facility 30 kW_{AC} or Less is considered complete when it provides all applicable and correct information required below. The City of Marshall may require additional information or clarification to evaluate the Interconnection Application.

Processing Fee

❑ A non-refundable processing fee of $100 must accompany this Application.

Customer

Name: _____ Utility Account Number: _____

Address: _____ Utility Location Number: _____

City: _____ State: _____ Zip: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

Is the Generation Facility owned by the Customer listed above? ❑ Yes ❑No

Contact (if different from Customer)

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

Generation Facility Information

Location (if different from above): _____

Inverter Manufacturer: _____

Model _____

Nameplate Rating: (kW) _____ (kVA) _____

System Design Capacity: (kW_{AC}) _____ (kVA_{AC}) _____

Energy Source: Solar ❑ Wind ❑

Is the Generation Facility equipment IEEE 1547/UL 1741 Certified? ❑ Yes ❑No

If Yes, attach manufacturer's documentation showing IEEE 1547/UL 1741 certification

City-Accessible Exterior Generator AC Disconnect Switch Provided (Required) ❑ Yes ❑No

Location of City-Accessible Exterior Generator AC Disconnect Switch _____
(e.g. Two feet west of electric meter)

Estimated Installation Date: _____ Estimated Commercial Operation Date: _____

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

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

Equipment Installation Contractor: **Indicate by owner if applicable** ❑

Name: _____
Mailing Address: _____
City: _____ State: _____ Zip Code: _____
Contact Person (If other than Above): _____
Telephone (Daytime): _____ (Evening): _____
Facsimile Number: _____ E-Mail Address: _____

Electrical Contractor: (If Applicable) **Indicate if not applicable** ❑

Name: _____
Mailing Address: _____
City: _____ State: _____ Zip Code: _____
Contact Person (If other than Above): _____
Telephone (Daytime): _____ (Evening): _____
Facsimile Number: _____ E-Mail Address: _____

Consulting Engineer: (If Applicable) **Indicate if not applicable** ❑

Name: _____
Mailing Address: _____
City: _____ State: _____ Zip Code: _____
Contact Person (If other than Above): _____
Telephone (Daytime): _____ (Evening): _____
Facsimile Number: _____ E-Mail Address: _____

Provide a one line diagram of the Generation Facility. 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, are noted by symbols. See attached example.

Copies of manufacturer's ownership, operating and maintenance manuals for all Generation equipment, inverters, and other proposed Generation Facility equipment must be submitted with this Application.

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 and conditions of the City of Marshall Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less and will return the Certificate of Completion to the Electric Utility when the Generation Facility has been installed and prior to commencing operation of said Generation Facility.

Signature: _____ Date: _____

----------**Utility Use**----------

Contingent Approval to Interconnect the Generation Facility

Interconnection of the Generation Facility is approved contingent upon Customer compliance with all of the terms and conditions of the City of Marshall Interconnection Standards and upon return of the Certificate of Completion prior to commencement of Commercial Operation of said Generation Facility.

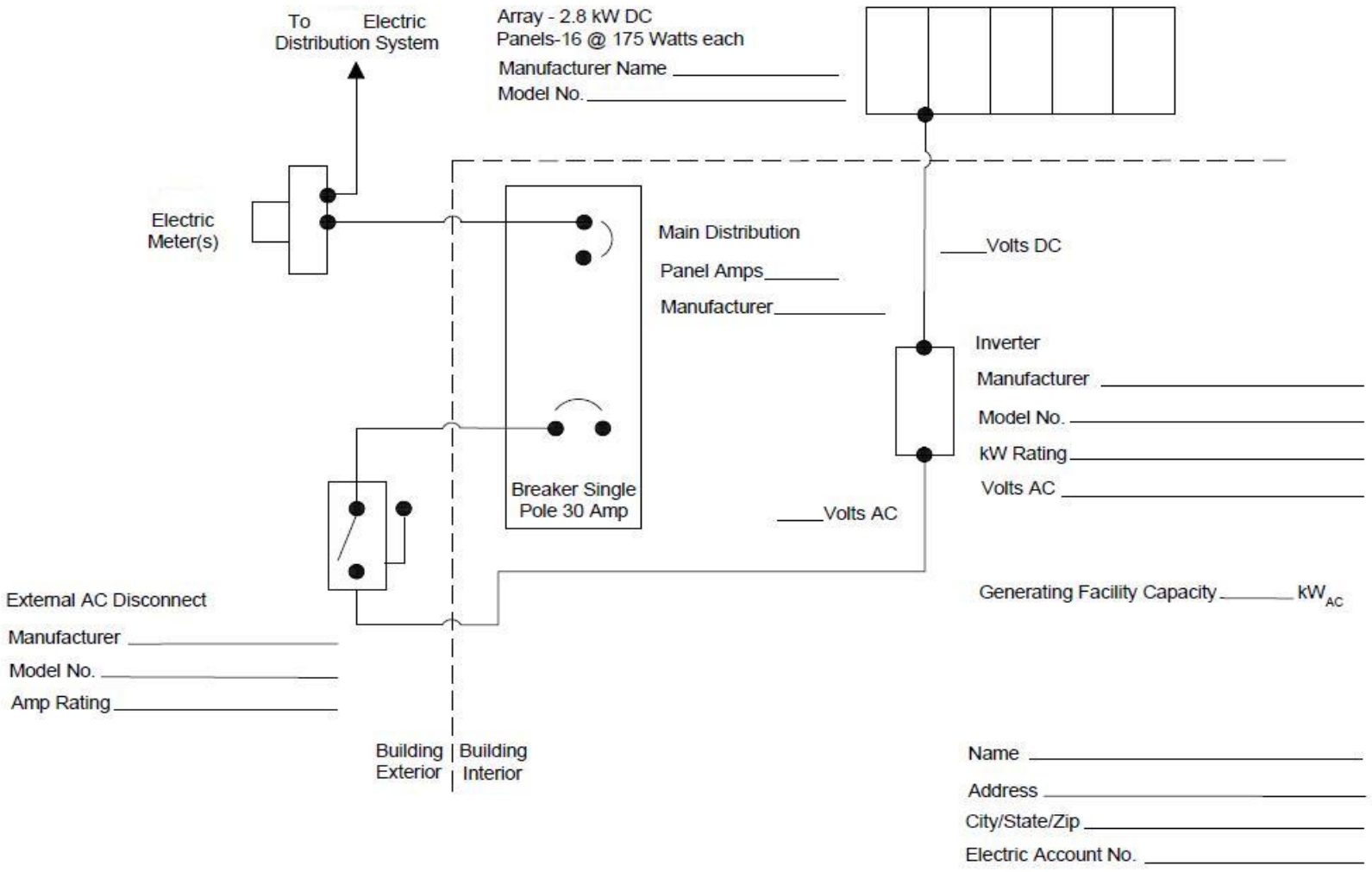
City of Marshall Signature: _____

Title: _____ Date: _____

Application Number: _____

City waives inspection/witness test? ❑Yes ❑No Initial _____

One Line Diagram Example



PART 4. INTERCONNECTION AGREEMENT

Application No. _____

City of Marshall Electric Department
Customer-Owned Renewable Electric Generation Facility 30 kW_{AC} or Less

This Agreement, ("**Agreement**") is entered into by and between the City of Marshall **("City")** and _____, ("**Customer**"). The Customer electric account subject to this Agreement is Account Number _____. Customer and the City are referenced in this Agreement collectively as "**Parties**" and individually as "**Party**."

Recitals

WHEREAS, the City and operates an Electric Distribution System serving the City of Marshall, Michigan, and surrounding area;

WHEREAS, Customer owns or desires to install, own and operate a City-approved renewable, inverter-based electric Generation Facility with a rated output of 30 kW_{AC} or less, interconnected with and operating in parallel with the Electric Distribution System;

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 Generation Facility will interconnect with and operate in parallel with the Electric Distribution System.

2. DEFINITIONS:

The definitions used in this Interconnection Agreement are those found in Part 1, Section 2 of the City Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less.

3. PARALLEL OPERATION:

Customer shall not interconnect or commence parallel operation of the Generation Facility until written Approval to Energize the Generation Facility under Part 6 of these Interconnection Standards has been provided by the City. Electric Utility shall have the right to have representatives present during initial testing of the Generation Facility and its protective apparatus.

4. INTERCONNECTION COSTS:

The Electric Utility has estimated the costs, including overheads, for necessary System Upgrades to its Electric Distribution System and Customer service connection, if any, and has provided a detailed itemization of such costs in the attached description of estimated System Upgrade costs. Prior to commencement of System Upgrades required to allow interconnection of the Customer-Owned Generation Facility, Customer shall deposit with the Electric Utility an amount equal to the estimated cost of said System Upgrades. If the actual costs of said System Upgrades are less than the amount deposited by the Customer, the Electric Utility will refund the difference to the Customer within 60 days of completing said System Upgrades. If the actual costs of said System Upgrades exceed the amount deposited by the Customer, the Electric Utility shall bill the Customer for the difference. Customer agrees to pay the invoiced amount within 30 days of the invoice date.

5. INTERRUPTION OR REDUCTION OF DELIVERIES:

The Electric Utility may require the Customer to interrupt or reduce energy deliveries when the Electric Utility determines, in its sole discretion, that curtailment, interruption or reduction is necessary because of maintenance, safety, emergency, Force Majeure or compliance with Prudent Utility Practices. No compensation or credit will be provided to the Customer by the Electric Utility for such interruptions or reductions in energy deliveries.

6. ADVERSE OPERATING EFFECTS:

The interconnection of the Generation Facility shall not reduce the reliability and quality of the City Electric Distribution System service. This includes, but is not limited to power quality issues such as Harmonic Distortion, Voltage Flicker and frequency deviations. The Electric Utility shall notify the Customer as soon as practicable if, based on Prudent Utility Practice, operation of the Generation Facility causes disruption in or deterioration of service to other Electric Utility customers or if operating the Generation Facility could damage the Electric Distribution System. If, after notice, the Customer fails to timely remedy the adverse operating effect, the City may disconnect the Generation Facility with no further notice.

7. LIMITATION OF LIABILITY AND INDEMNIFICATION:

Customer shall assume all liability for and agrees to indemnify the Electric Utility and the City of Marshall for any claims, losses, costs, and expenses of any kind or character to the extent that they result from the design, construction, operation or maintenance of the Generation Facility. Such indemnity shall include, but is not limited to, financial responsibility for: (a) the Electric Utility's monetary losses; (b) reasonable costs and expenses of defending an action or claim made by a third party; (c) damages related to the death or injury of a third party; (d) damages to the property of the Electric Utility; (e) damages to the property of a third party; (f) damages for the disruption of the business of a third party. This paragraph does not create a liability on the part of the Customer to the Electric Utility, the City or a third party, but requires indemnification where such liability

exists. The limitations of liability provided in this paragraph do not apply in cases of gross negligence or intentional wrongdoing.

8. ACCESS TO PREMISES:

Electric Utility shall have access to the Customer premises or property and to the Exterior AC Generator Disconnect Switch as permitted in its policies, Rules and Regulations and these Interconnection Standards.

9. GOVERNING LAW:

This Agreement shall be interpreted and governed under the laws of the State of Michigan, the ordinances and resolutions of the Marshall City Council, City Electric Department Standard Rules and Regulations and applicable City Electric Rates.

10. DOCUMENTS:

This Agreement incorporates all other provisions and related documents of these Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less as the same may be amended from time to time.

11. NOTICES:

All written notices shall be directed as follows:

Customer:	**City of Marshall:**
Name: _____	Name: _____
Address: _____	Title: _____
City/State/Zip: _____	City/State/Zip: _____

12. TERM OF AGREEMENT:

This Agreement shall be in effect when executed by the Customer and the City and shall remain in effect thereafter month to month unless terminated in accordance with the provisions of Section 14 of "Part 2. Technical Requirements."

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.

Customer:	**For City of Marshall:**
_____	_____
Signature	Signature
_____	_____
Print Name	Print Name and Title
_____	_____
Date	Date

PART 5. CERTIFICATE OF COMPLETION

Application No. _____

City of Marshall Electric Department
Customer-Owned Renewable Electric Generation Facility

Is the Generation Facility installed, tested and ready for operation? Yes_____ No _____

Customer: _____ Utility Account Number: _____

Address: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

Location of the Generation Facility (if different from above):

_____

Electrician/Service Company:

Name: _____

Address: _____

City/State/Zip: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

License number: _____

Date City of Marshall approved interconnection of Generation Facility: _____

Application number: _____

Inspection:

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

A copy of the signed electrical inspection form is attached. ❑Yes ❑No

(If inspection form is not attached)

_____ _____

Signature of inspector: **Date**

_____

Printed name of inspector

PART 6. APPROVAL TO ENERGIZE GENERATION FACILITY

Application No. _____

City of Marshall Electric Department
Customer-Owned Renewable Electric Generation Facility

The City of Marshall Electric Department, having entered into an Interconnection Agreement for the Generation Facility described in the Application noted by number above and having received a Certificate of Completion with proper documentation of the electrical inspection hereby authorizes the Generation Facility to be energized:

City of Marshall Signature: _____

Title: _____ Date: _____

PART 7. RENEWABLE ENERGY NET METERING RIDER – APPLICATION FOR SERVICE

Application No. _____

City of Marshall Electric Department

Customer Name: _____

Service Address: _____

City: _____ State: _____ Zip: _____

Utility Account Number: _____

Contact Person: _____

Telephone Number: _____

Address: _____

City: _____ State: _____ Zip: _____

E-Mail Address: _____

This application is for electric service under the City of Marshall ("City") Renewable Energy Net Metering Rider for the above customer ("Customer"). The Customer Generation Facility is a solar or wind Generation Facility as defined in the City's Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less.

The Generation Facility qualifies for the Net Metering Rider as it meets the definitions and requirements of said Interconnection Standards. Total rated output of the Generation Facility under the Renewable Energy Net Metering Rider, is ____ kW_{AC}. Customer acknowledges that he/she has read the Rider and agrees to all terms and conditions contained therein, including without limitation those specified in the Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less. Specifically, the Customer understands and agrees that an electric meter or meters capable of registering the flow of electricity in each direction must be in service at the facility. If a City-approved meter with this capability is not in service, Customer must submit a written request to the Electric Utility to acquire, install, maintain, and read an approved meter or meters at the Customer's cost. All costs related to installation of said meter or meters shall be borne by the Customer.

Customer acknowledges and agrees that operation of said Generation Facility is intended primarily to offset part or all of Customer's electricity requirements, and that the Generation Facility including any related energy storage, is not sized to exceed the annual electric energy requirements of the Customer's premises. Customer further acknowledges and agrees that the Electric Utility will not provide credit for surplus energy generated by the Generation Facility under the Renewable Energy Net Metering Rider that exceeds the Customer's annual energy consumption.

Requested By:

_____

Customer Name

_____

Authorized Signature

_____

Date

Approved By:

_____

Name

_____

City of Marshall Signature

_____

Date

Rejected:

_____

Name

_____

City of Marshall Signature

_____

Reason for Rejection

_____

Date

PART 8. RENEWABLE ENERGY NET METERING RATE RIDER

1. AVAILABILITY

Service under this Renewable Energy Net Metering Rate Rider is available to City of Marshall Electric Department ("City") Electric Utility customers in good standing with a Customer-Owned wind or solar renewable electric Generation Facility as defined in the City Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less that wish to receive a billing credit for surplus renewable energy supplied to the Electric Utility subject to the terms and conditions of this Rate Rider. Customer-Owned renewable generation and associated equipment are collectively referred to as a Generation Facility. Customers served under this Rate Rider must also receive service under the standard service electric rate schedule that would apply if the Customer did not have an interconnected Generation Facility.

2. CONDITIONS OF SERVICE

A qualifying Customer is a Residential or Commercial electric customer connected to the Electric Distribution System for the purpose of receiving retail electric service that also owns and operates a Generation Facility as defined in the City Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less. The Generation Facility shall be installed and operated in accordance with the requirements of said City Interconnection Standards.

3. METERING

Metering shall be accomplished by use of an Electric Utility approved electric meter or meters capable of registering the flow of electricity in each direction. If the existing electric meter installed at the Customer's premises is not capable of measuring the bidirectional flow of electricity, the Electric Utility, upon written request of the Customer, shall install at the Customer's expense an appropriate meter or meters with such capability. The Electric Utility may, at its own expense, install one or more additional meters to monitor the flow of electricity.

4. CUSTOMER BILLING CREDIT

a. Customers served under the Net Metering Rate Rider must receive service under the standard service electric rate schedule that would apply if the Customer did not have an interconnected Generation Facility.

b. Customer will be billed using the Unbundled Rate option of said applicable rate schedule.

c. The billing credit for surplus renewable energy generated by the Generation Facility and delivered to the Electric Distribution System shall be in accordance with the Unbundled Rate option of the applicable rate schedule.

d. In the event that the energy (kWh) generated by the Generation Facility exceeds the energy (kWh) consumed by the Customer at the Customer's premises during any annual period, or portion thereof, no credit shall be provided for energy (in kWh) in excess of the Customer's energy consumption during said annual period, or portion thereof.

5. OTHER TERMS AND CONDITIONS

a. The Electric Utility shall offer this Renewable Energy Net Metering Rate Rider to its Customers that wish to receive billing credit for surplus renewable energy supplied to the Electric Utility from eligible Customer-Owned Generation Facilities.

b. This Rate Rider shall only be available to Customers in good standing under the Electric Utility's electric rate schedules and Electric Department General Rules and Regulations. All agreements hereunder shall be between the Customer and the City and will not include third parties.

c. The Interconnection Agreement between the City and Customer must remain in effect and the Customer-Owned Generation Facility must be in full compliance with the terms and conditions of the Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less.

d. The charges and credits for service under this Rate Rider are exclusive of and in addition to charges for service rendered to the Customer under any other applicable rate schedule.

e. Service under this Rate Rider is subject to all applicable provisions of the ordinances and resolutions of Marshall City Council, City Electric Department Standard Rules and Regulations, and applicable Electric Rates.

f. Any insurance coverage that may be required is specifically addressed in the Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less.

g. Nothing in this Rate Rider shall abrogate any Customer's obligation to comply with all applicable Federal, State and Local laws, codes or Ordinances.

6. SPECIAL TERMS AND CONDITIONS

This Renewable Energy Net Metering Rate Rider is subject to the terms and conditions of the applicable electric rate schedule under which the customer receives service, ordinances and resolutions of Marshall City Council, City Electric Department Rules and Regulations, and applicable Electric Rates. This schedule is also subject to the applicable provisions of the Interconnection Standards for Installation and Parallel Operation of Customer-Owned Renewable Electric Generation Facilities 30 kW_{AC} or Less.