Kansas Electric Cooperative Net Metering Application Guidance

Our experience has been that Bluestem and other Kansas electric cooperatives have been very good to work with… “cooperative”. Bluestem Electric has adopted a uniform procedure common to most if not all Kansas Rural Electric Co-ops (REC)s, to process requests for interconnecting generating wind or solar facilities. Please click the link below for the appropriate size:

Generation Interconnection Request Form for 10kW or less

Generation Interconnection Request Form for 10kW to 2MW

FHREEC works to provide low cost but excellent hardware, helps families plan their system and arrange the installation of arrays on their roofs or property. In exchange for very low costs for a solar array, you will have to do some of the paperwork, and arrange to get help on your installation. We will be there as volunteers to consult but not as representatives of FHREEC. It will be great if you also pass your new found skills to others. Any homeowner can legally do electrical work on their own residence, but we highly recommend that you hire a licensed electrician to do this.

Permits

Towns

We're not licensed or insured as general or electrical contractors...either by the city or your Cooperative. They will often require a licensed electrician to sign off before they give you a green tag to interconnect with their powerlines. We'll be happy to visit with any electrician of your choice at your house to explain what will be needed and answer questions. Small towns are a wide mix in their acceptance of solar power by their citizens.

On the one hand they have been shown to benefit from rooftop solar because it takes the heat stress out of their distribution system, and helps avoid the towns' ratcheting peak demand charges. On the other hand, towns sometimes profit from their energy sales which fund parks and other town services. *So be sure to check with them first about their policies and charges before you install a system.*

Cooperative Interconnection

As mentioned on Bluestem's page there are two system size applications: those under 10KW and those over. The 10KW limit sets the maximum system size as 33 panels, or one pallet of our current panels. "Certified Inverter-Based Small Generating Facility No Larger than 10kW is subject to a non-refundable processing fee of $500.00."

Several documents will be required to be uploaded as jpg files. You can download examples of these documents *at the end of this pdf*. Obviously your site map will have to be customized for your property. We use a snipping tool of the screen shot from Google Earth or the county GIS website for the aerial photo of a property.

As you have questions don't hesitate to call or email us:

Flint Hills Renewable Energy & Efficiency Cooperative, Inc.
mail@fhreec.org
785/564-2583

Procedures for Interconnecting a Certified Inverter-Based Small Generating Facility No Larger than 10 kW ("10 kW Inverter Process")

Bluestem Electric Cooperative, Inc has adopted a uniform procedure to process requests for interconnecting small, inverter-based generating facilities no larger than 10 kW. The procedure was developed by the Federal Energy Regulatory Commission (FERC) as a way of streamlining the process of Member interconnections and includes these documents:

- This description of the procedures involved in the interconnection process;
- The Application for interconnecting the generator;
- The Terms and Conditions of the interconnection;
- The Certificate of Completion

The process contains the following steps:

1.0 The Interconnection Member ("Member") completes the Interconnection Request ("Application") and submits it to Bluestem Electric Cooperative, Inc. ("Cooperative").

2.0 The Cooperative acknowledges to the Member receipt of the Application within three Business Days of receipt.

3.0 The Cooperative evaluates the Application for completeness and notifies the Member within ten Business Days of receipt that the Application is or is not complete and, if not, advises what material is missing.

4.0 The Cooperative verifies that the Small Generating Facility can be interconnected safely and reliably using the screens contained in the Fast Track Process in the Small Generator Interconnection Procedures (SGIP), reprinted below. The Cooperative has 15 Business Days to complete this process. Unless the Cooperative determines and demonstrates that the Small Generating Facility cannot be interconnected safely and reliably, the Cooperative approves the Application and returns it to the Member. Note to Member: Please check with the Cooperative before submitting the Application if disconnection equipment is required.

4.0.1 Screens

4.0.1.1 The proposed Small Generating Facility's Point of Interconnection must be on a portion of the Cooperative's Distribution System that is subject to the Tariff.

4.0.1.2 For interconnection of a proposed Small Generating Facility to a radial distribution circuit, the aggregated generation, including the proposed Small Generating Facility, on the circuit shall not exceed 15 % of the line section annual peak load as most recently measured at the substation. A line section is that portion of a Cooperative's electric system connected to a Member bounded by automatic sectionalizing devices or the end of the distribution line.

4.0.1.3 For interconnection of a proposed Small Generating Facility to the load side of spot network protectors, the proposed Small Generating Facility must utilize an inverter-based equipment package and, together with the aggregated other inverter-based generation, shall not exceed the smaller of 5 % of a spot network's maximum load or 50 kW[1].

4.0.1.4 The proposed Small Generating Facility, in aggregation with other generation on the distribution circuit, shall not contribute more than 10 % to the distribution circuit's maximum fault current at the point on the high voltage (primary) level nearest the proposed point of change of ownership.

4.0.1.5 The proposed Small Generating Facility, in aggregate with other generation on the distribution circuit, shall not cause any distribution protective devices and equipment (including, but not limited to, substation breakers, fuse cutouts, and line reclosers), or Interconnection Member equipment on the system to exceed 87.5 % of the short circuit interrupting capability; nor shall the interconnection be proposed for a circuit that already exceeds 87.5 % of the short circuit interrupting capability.

4.0.1.6 Using the table below, determine the type of interconnection to a primary distribution line. This screen includes a review of the type of electrical service provided to the Interconnecting Member, including line configuration and the transformer connection to limit the potential for creating over-voltages on the Cooperative's electric power system due to a loss of ground during the operating time of any anti-islanding function.

Primary Distribution Line Type	Type of Interconnection to Primary Distribution Line	Result/Criteria
Three-phase, three wire	3-phase or single phase, phase-to-phase	Pass screen
Three-phase, four wire	Effectively-grounded 3 phase or Single-phase, line-to-neutral	Pass screen

4.0.1.7 If the proposed Small Generating Facility is to be interconnected on single-phase shared secondary, the aggregate generation capacity on the shared secondary, including the proposed Small Generating Facility, shall not exceed 20 kW.

[1] A spot Network is a type of distribution system found within modern commercial buildings to provide high reliability of service to a single Member. (Standard Handbook for Electrical Engineers, 11th edition, Donald Fink, McGraw Hill Book Cooperative)

4.0.1.8 If the proposed Small Generating Facility is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, its addition shall not create an imbalance between the two sides of the 240 volt service of more than 20 % of the nameplate rating of the service transformer.

4.0.1.9 The Small Generating Facility, in aggregate with other generation interconnected to the transmission side of a substation transformer feeding the circuit where the Small Generating Facility proposes to interconnect shall not exceed 10 MW in an area where there are known, or posted, transient stability limitations to generating units located in the general electrical vicinity (e.g., three or four transmission busses from the point of interconnection).

4.0.1.10 No construction of facilities by the Cooperative on its own system shall be required to accommodate the Small Generating Facility.

5.0 After installation, the Member returns the Certificate of Completion to the Cooperative. Prior to parallel operation, the Cooperative may inspect the Small Generating Facility for compliance with standards which may include a witness test, and may schedule appropriate metering replacement, if necessary.

6.0 The Cooperative notifies the Member in writing that interconnection of the Small Generating Facility is authorized. If the witness test is not satisfactory, the Cooperative has the right to disconnect the Small Generating Facility. The Member has no right to operate in parallel until a witness test has been performed, or previously waived on the Application. The Cooperative is obligated to complete this witness test within ten Business Days of the receipt of the Certificate of Completion. If the Cooperative does not inspect within ten Business Days or by mutual agreement of the Parties, the witness test is deemed waived.

7.0 Contact Information – The Member must provide the contact information for the legal applicant (i.e., the Interconnection Member). If another entity is responsible for interfacing with the Cooperative, that contact information must be provided on the Application.

8.0 Ownership Information – Enter the legal names of the owner(s) of the Small Generating Facility. Include the percentage ownership (if any) by any utility or public utility holding Cooperative, or by any entity owned by either.

9.0 UL1741 Listed – This standard ("Inverters, Converters, and Controllers for Use in Independent Power Systems") addresses the electrical interconnection design of various forms of generating equipment. Many manufacturers submit their equipment to a Nationally Recognized Testing Laboratory (NRTL) that verifies compliance with UL1741. This "listing" is then marked on the equipment and supporting documentation.

Application for Interconnecting a Certified Inverter-Based Small Generating Facility No Larger than 10kW

This Application is considered complete when it provides all applicable and correct information required below. Additional information to evaluate the Application may be required.

Processing Fee

The Application for Interconnecting a Certified Inverter-Based Small Generating Facility No Larger than 10kW is subject to a non-refundable processing fee of $500.00. If the cooperative incurred any additional cost in the application process, then these costs shall be paid in full prior to Bluestem signing the Certificate of Completion. Application fees for Interconnecting a Certified Inverter-Based Small Generating Facility No Larger than 10kW are subject to review by the Bluestem Board of Trustees at any time but not less than annually.

Interconnection Member

Name: _____

Contact Person: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

Contact (if different from Interconnection Member)

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

Owner of the facility (include % ownership by any electric utility): _____

Small Generating Facility Information

Location (if different from above): _____

Electric Service Cooperative: _____

Account Number: _____

Inverter Manufacturer: Enphase Energy Model: IQ 7+

Nameplate Rating: .295 (kW) _____ (kVA) 240 (AC Volts) ☐ Single Phase ☐ Three Phase

System Design Capacity: _____ (kW) _____ (kVA) # Panels x .295KW

Prime Mover: ☒ Photovoltaic ☐ Reciprocating Engine ☐ Fuel Cell ☐ Turbine ☐ Other _____

Energy Source: ☒ Solar ☐ Wind ☐ Hydro ☐ Diesel ☐ Natural Gas ☐ Fuel Oil
☐ Other (describe) _____

Is the equipment UL1741 Listed? ☒ Yes ☐ No

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

Estimated Installation Date: _____ Estimated In-Service Date: _____

The 10 kW Inverter Process is available only for inverter-based Small Generating Facilities no larger than 10 kW that meet the codes, standards, and certification requirements of Attachments 3 and 4 of the FERC Small Generator Interconnection Procedures (SGIP), or the Cooperative has reviewed the design or tested the proposed Small Generating Facility and is satisfied that it is safe to operate.

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

	Equipment Type	Certifying Entity
1.		
2.	REC Solar TP2S 375	CSA US
3.	Enphase Energy IQ 7+	UL
4.	IronRidge Rails	UL 2703
5.		

Interconnection Member 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 for Interconnecting an Inverter-Based Small Generating Facility No Larger than 10kW and return the Certificate of Completion when the Small Generating Facility has been installed.

Signed: _____

Title: _____ Date: _____

(For Cooperative use only)

Contingent Approval to Interconnect the Small Generating Facility

Interconnection of the Small Generating Facility is approved contingent upon the Terms and Conditions for Interconnecting an Inverter-Based Small Generating Facility No Larger than 10kW and return of the Certificate of Completion.

Cooperative Signature: _____

Title: _____ Date: _____

Application ID number: _____

Cooperative waives inspection/witness test? ☐ Yes ☐ No

CERTIFICATE OF COMPLIANCE

Certificate Number	20200212-E341165
Report Reference	E341165-20171030
Issue Date	2020-FEB-12
Issued to:	Enphase Energy Inc. 1420 N. McDowell Blvd. Petaluma, CA 94954-6515
This is to certify that representative samples of	Photovolic Grid Support Utility Interactive Inverter with Rapid Shutdown Functionality Models IQ7-60, IQ7PLUS-72, IQ7X-96, IQ7XS-96, may be f/b -2, 5 or -E, may be f/b ACM, f/b US+, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters. Models IQ7A, may be f/b S, may be f/b 66 or -72, may be f/b -2, 5, -E, or ACM, f/b -US+, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters.
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 1741, Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741, Second Edition, dated January 28, 2010. Including the requirements in UL 1741 Supplement SA, sections as noted in the Technical considerations. IEEE 1547, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems. IEEE 1547.1, IEEE Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems. UL 62109-1, Safety of Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements; IEC 62109-2, Safety of Power Converters for use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters. CSA C22.2 No. 107.1-01, General Use Power Supplies.
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

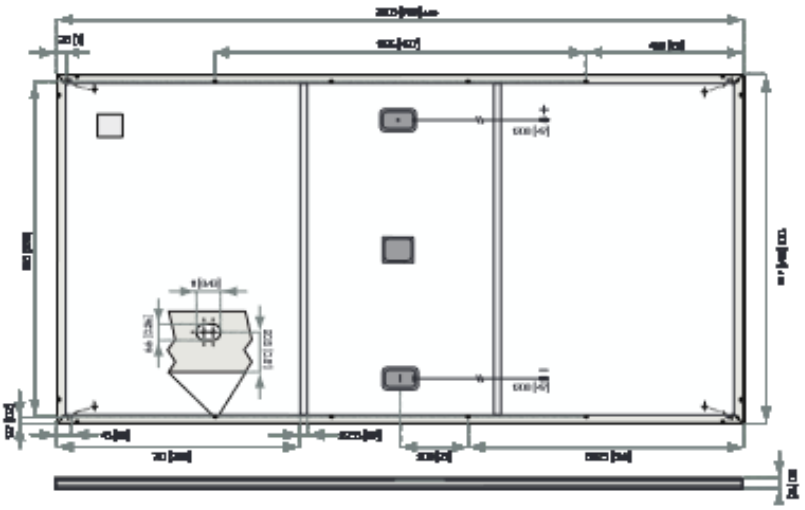
Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

Solar Panel Data Sheet Example

REC TWINPEAK 2S MONO 72 SERIES



All measurements in mm [in]

ELECTRICAL DATA @ STC	Product code*: RECxxxTP2SM 72						
Nominal Power - P_{MPP} (Wp)	370	375	380	385	390	395	400
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V_{MPP} (V)	39.8	40.1	40.3	40.5	40.7	40.9	41.1
Nominal Power Current - I_{MPP} (A)	9.30	9.36	9.43	9.51	9.58	9.66	9.73
Open Circuit Voltage - V_{OC} (V)	47.0	47.4	48.0	48.6	49.2	49.8	50.4
Short Circuit Current - I_{SC} (A)	10.02	10.04	10.05	10.07	10.08	10.09	10.10
Panel Efficiency (%)	18.4	18.7	18.9	19.2	19.4	19.7	20.0

Values at standard test conditions STC (airmass AM 1.5, irradiance 1000 W/m², cell temperature 77°F (25°C)).
At low irradiance of 200 W/m² (AM 1.5 and cell temperature 77°F (25°C)) at least 95% of the STC module efficiency will be achieved.
*xxx indicates the nominal power class (P_{MPP}) at STC, and can be followed by the suffix XV for modules with a 1500 V maximum system rating.

ELECTRICAL DATA @ NMOT	Product code*: RECxxxTP2SM 72						
Nominal Power - P_{MPP} (Wp)	276	280	283	287	290	295	298
Nominal Power Voltage - V_{MPP} (V)	37.1	37.3	37.5	37.7	37.9	38.1	38.3
Nominal Power Current - I_{MPP} (A)	7.44	7.49	7.54	7.60	7.66	7.73	7.78
Open Circuit Voltage - V_{OC} (V)	43.7	44.1	44.7	45.3	45.8	46.4	46.9
Short Circuit Current - I_{SC} (A)	8.02	8.03	8.04	8.06	8.06	8.07	8.08

Nominal cell operating temperature NOCT (800 W/m², AM 1.5, windspeed 1 m/s, ambient temperature 68°F (20°C)).
*xxx indicates the nominal power class (P_{MPP}) at STC, and can be followed by the suffix XV for modules with a 1500 V maximum system rating.

CERTIFICATION

C US

UL 1703, Fire classification: Type 1 (1500 V XV); Type 2 (1000 V); IEC 61215, IEC 61730, IEC 62804 (PID), IEC 62716 (Ammonia), IEC 61701 (Salt Mist level 6), ISO 9001:2015, ISO 14001:2004, OHSAS 18001:2007

WARRANTY

20 year product warranty
25 year linear power output warranty
Max. performance degression of 0.5% p.a. from 97.5% in year 1
See warranty conditions for further details.

20.0% EFFICIENCY

20 YEAR PRODUCT WARRANTY

25 YEAR LINEAR POWER OUTPUT WARRANTY

GENERAL DATA

Cell type:	144 half-cut monocrystalline PERC cells 6 strings of 24 cells in series
Glass:	0.13" (3.2 mm) solar glass with anti-reflection surface treatment
Backsheet:	Highly resistant polymeric construction
Frame:	Anodized aluminum
Support bars:	Anodized aluminum
Junction box:	3-part, 3 bypass diodes, IP67 rated in accordance with IEC 62790
Cable:	4 mm² solar cable, 1.2 m + 1.2 m in accordance with EN 50618
Connectors:	Tonglin TL-Cable01S-F (4 mm²) in accordance with IEC 62852, IP68 only when connected
Origin:	Made in Singapore

MAXIMUM RATINGS

Operational temperature:	-40 ... +185°F (-40 ... +85°C)
Maximum system voltage:	1000 V / 1500 V
Design load (+): snow Maximum test load (+):	75.2 lbs/ft² (3600 Pa)* 112.8 lbs/ft² (5400 Pa)*
Design load (-): wind Maximum test load (-):	33.4 lbs/ft² (1600 Pa)* 50.1 lbs/ft² (2400 Pa)*
Max series fuse rating:	25 A
Max reverse current:	25 A

* Calculated using a safety factor of 1.5
* See installation manual for mounting instructions

TEMPERATURE RATINGS

Nominal Module Operating Temperature:	44.6°C (±2°C)
Temperature coefficient of P_{MPP}:	-0.37 %/°C
Temperature coefficient of V_{OC}:	-0.28 %/°C
Temperature coefficient of I_{SC}:	0.04 %/°C

*The temperature coefficients stated are linear values

MECHANICAL DATA

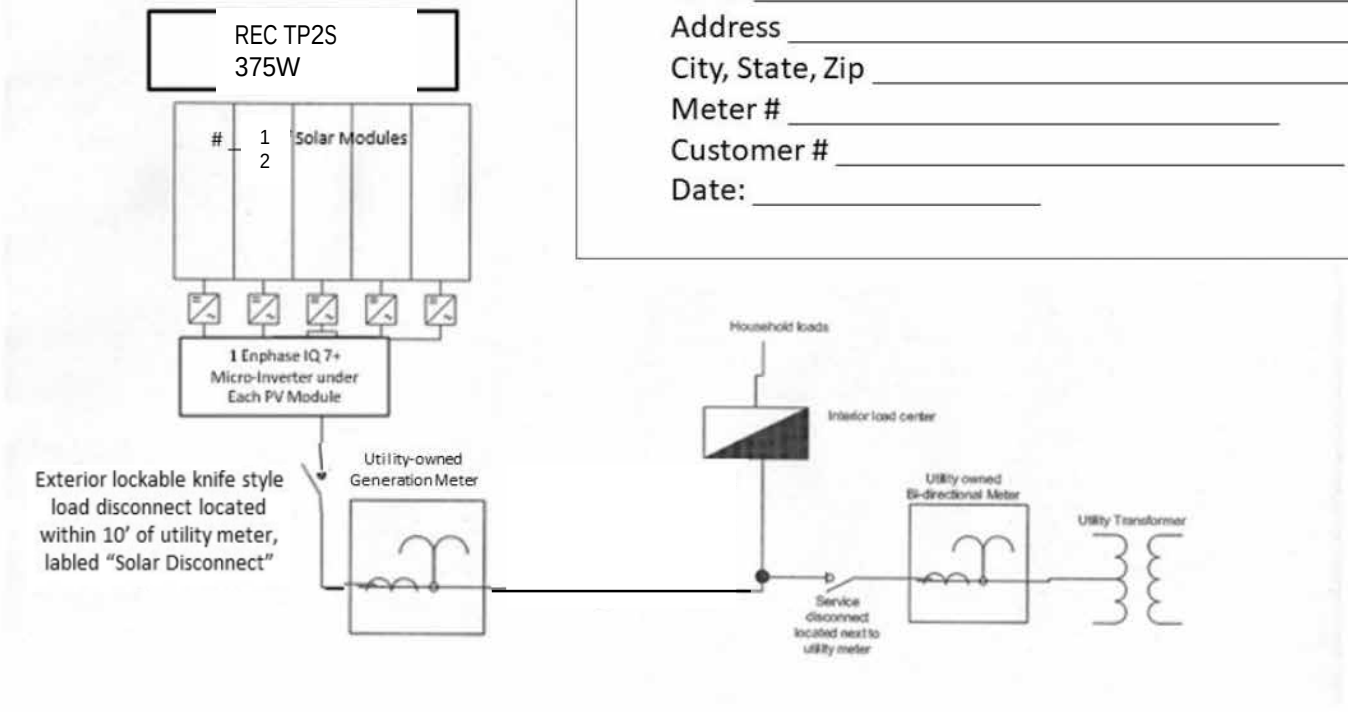
Dimensions:	78.9" x 39.4" x 1.2" (2005 x 1001 x 30 mm)
Area:	21.6 ft² (2.01 m²)
Weight:	48.5 lbs (22 kg)

Specifications subject to change without notice.

Ref: PW-DS-07-23 Rev-B 07.19

One-Line Diagram

Name_____
Address _____
City, State, Zip _____
Meter # _____
Customer # _____
Date: _____



Terms and Conditions for Interconnecting an Inverter-Based Small Generating Facility No Larger than 10kW

1.0 **Construction of the Facility**

The Interconnection Member (the "Member") may proceed to construct (including operational testing not to exceed two hours) the Small Generating Facility when Bluestem Electric Cooperative, Inc. (the "Cooperative") approves the Interconnection Request (the "Application") and returns it to the Member.

2.0 **Interconnection and Operation**

The Member may operate Small Generating Facility and interconnect with the Cooperative's electric system once all of the following have occurred:

2.1 Upon completing construction, the Member will cause the Small Generating Facility to be inspected or otherwise certified by the appropriate local electrical wiring inspector with jurisdiction, and

2.2 The Member returns the Certificate of Completion to the Cooperative, and

2.3 The Cooperative has either:

2.3.1 Completed its inspection of the Small Generating Facility to ensure that all equipment has been appropriately installed and that all electrical connections have been made in accordance with applicable codes. All inspections must be conducted by the Cooperative, at its own expense, within ten Business Days after receipt of the Certificate of Completion and shall take place at a time agreeable to the Parties. The Cooperative shall provide a written statement that the Small Generating Facility has passed inspection or shall notify the Member of what steps it must take to pass inspection as soon as practicable after the inspection takes place; or

2.3.2 If the Cooperative does not schedule an inspection of the Small Generating Facility within ten business days after receiving the Certificate of Completion, the witness test is deemed waived (unless the Parties agree otherwise); or

2.3.3 The Cooperative waives the right to inspect the Small Generating Facility.

2.4 The Cooperative has the right to disconnect the Small Generating Facility in the event of improper installation or failure to return the Certificate of Completion.

2.5 Revenue quality metering equipment must be installed and tested in accordance with applicable ANSI standards.

3.0 **Safe Operations and Maintenance**

The Member shall be fully responsible to operate, maintain, and repair the Small Generating Facility as required to ensure that it complies at all times with the interconnection standards to which it has been certified.

4.0 **Access**

The Cooperative shall have access to the disconnect switch (if the disconnect switch is required) and metering equipment of the Small Generating Facility at all times. The Cooperative shall provide reasonable notice to the Member when possible prior to using its right of access.

5.0 **Disconnection**

The Cooperative may temporarily disconnect the Small Generating Facility upon the following conditions:

5.1 For scheduled outages upon reasonable notice.

5.2 For unscheduled outages or emergency conditions.

5.3 If the Small Generating Facility does not operate in the manner consistent with these Terms and Conditions.

5.4 The Cooperative shall inform the Member in advance of any scheduled disconnection, or as is reasonable after an unscheduled disconnection.

6.0 **Indemnification**

The Parties shall at all times indemnify, defend, and save the other Party harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other Party's action or inactions of its obligations under this agreement on behalf of the indemnifying Party, except in cases of gross negligence or intentional wrongdoing by the indemnified Party.

7. 0 **Insurance**

The Parties agree to follow all applicable insurance requirements imposed by the state in which the Point of Interconnection is located. All insurance policies must be maintained with insurers authorized to do business in that state.

8.0 **Limitation of Liability**

Each party's liability to the other party for any loss, cost, claim, injury, liability, or expense, including reasonable attorney's fees, relating to or arising from any act or omission in its performance of this Agreement, shall be limited to the amount of direct damage actually incurred. In no event shall either party be liable to the other party for any indirect, incidental, special, consequential, or punitive damages of any kind whatsoever, except as allowed under paragraph 6.0.

9.0 **Termination**

The agreement to operate in parallel may be terminated under the following conditions:

9.1 **By the Member**

By providing written notice to the Cooperative.

9.2 **By the Cooperative**

If the Small Generating Facility fails to operate for any consecutive 12 month period or the Member fails to remedy a violation of these Terms and Conditions.

9.3 **Permanent Disconnection**

In the event this Agreement is terminated, the Cooperative shall have the right to disconnect its facilities or direct the Member to disconnect its Small Generating Facility.

9.4 **Survival Rights**

This Agreement shall continue in effect after termination to the extent necessary to allow or require either Party to fulfill rights or obligations that arose under the Agreement.

10.0 **Assignment/Transfer of Ownership of the Facility**

This Agreement shall survive the transfer of ownership of the Small Generating Facility to a new owner when the new owner agrees in writing to comply with the terms of this Agreement and so notifies the Cooperative.

Small Generating Facility Certificate of Completion

Is the Small Generating Facility owner-installed? ☐ Yes ☐ No

Interconnection Member: _____

Contact Person: _____

Address: _____

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

Address: _____

City: _____ State: _____ Zip Code: _____

Telephone: (Day) _____ (Evening) _____

Fax: _____ E-Mail Address: _____

Electrician:

Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

License number: _____

Date Approval to Install Facility granted by the Cooperative: _____

Application ID number: _____

Inspection:

The Small Generating Facility has been installed and inspected in compliance with the local building/electrical code of _____

_____ _____

Signed (Local electrical wiring inspector, or attach signed electrical inspection) Print Name

Date: _____

As a condition of interconnection, you are required to send/fax a copy of this form along with a copy of the signed electrical permit to (insert Cooperative information below):

Name: Kevin Heptig
Cooperative: Bluestem Electric Cooperative, Inc.
Address: P.O. Box 5; 1000 South Wind Drive, Wamego, KS 66547-0005
Email: kevinh@bluestemelectric.com ; Fax: (785) 456-2003

Approval to Energize the Small Generating Facility (For Cooperative use only)

Energizing the Small Generating Facility is approved contingent upon the Terms and Conditions for Interconnecting an Inverter-Based Small Generating Facility No Larger than 10kW

Cooperative Signature: _____

Title: _____ Date: _____