Policy and Guidelines
for
Interconnection for Parallel Installation and Operation
of
Small (25 kW-DC or less) and Large (greater than 25 kW-DC)
Customer-Owned
Renewable Electric Generating Facilities
_____, 20_____

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 of the Utility's Electric Wholesale Supplier (EWS) 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 premise 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 and from the Utility's Wholesale supplier(s).

f. **Electric Wholesale Supplier (EWS)** – The Utility's total requirements electric wholesale supplier.

g. **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.

h. **Generating Facility** – For purposes of this Standard, the customer's device for the conversion of renewable generation like bio fuel, hydro, wind or solar energy to electricity, as identified in the Interconnection Application and able to be certified as a Qualifying Facility under the definitions in The Public Utility Regulatory Policies Act (PURPA, Pub. L. 95–617, 92 Stat. 3117, enacted November 9, 1978), a United States Act passed as part of the National Energy Act and as amended.

i. **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.

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. **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.

l. **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 Policy and Guidelines for Interconnection of Parallel Installation and Operation of Small (25 kW-DC or less) and Large (greater than 25 kW-DC) Customer-Owned Renewable Electric Generating Facilities as of the date adopted and printed on the cover page.

m. **Qualifying Facility** – A *generation* facility that is a Qualifying Facility under 18 CFR Part 292, Subpart B, and is proposed to be 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 subparagraph "h" 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. **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 who owns a Generating Facility and the Utility (Utility) and when applicable the Utility's full requirements Electric Wholesale Supplier (EWS).

b. The Interconnection Standards for small customer-owned renewable electric Generating

Facilities apply to a Generating Facility with rated output 100 kilowatts (kW-DC) or less. Eligibility of a Generating Facility with rated output of greater than 100 kW-DC will be determined on a case-by-case basis regarding voltage level of connection, metering and purchase of output. However, a similar Facilities Interconnection Agreement will also apply.

4. REQUEST:

A Customer desiring to interconnect a qualifying Generating Facility must complete and return to the Utility an *Application for Interconnection* (Document A) with payment of the applicable processing fee. The processing fee for 25 kW (DC rated generators) and under is $250. The processing fee for 25 kW-DC to 100 kW-DC is $500. The Utility and the EWS may require additional details or clarifications as needed to properly evaluate the application.

The Utility requires, on behalf of its EWS, that the Customer provide the capability to deliver hourly generator AC output meter readings (net of any generator auxiliary usage) to the EWS. The Customer needs to install a meter socket that meets the EWS' specifications between the Inverter and the AC connection to the Customer's load panel. The Utility shall have the right to install such additional metering equipment as it deems necessary for the collection of data for research purposes, which metering will be furnished and paid for by the Utility.

5. SYSTEM EFFECTS:

The Utility and the EWS 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 fluctuations, power quality, system stability, etc.

6. SYSTEM UPGRADES:

As a result of the above analysis, the Utility and the EWS will provide the Customer with a cost estimate and projected timeframe for any system upgrades that may be necessary to accommodate the Generating Facility (Document B).

7. AGREEMENT:

Once the Customer, the Utility and EWS have identified and mutually agreed upon 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 ***Customer-Owned Generation Facilities 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 Section 7 of Part 2 below as "National Certification Codes and Standards".
c. The construction and facilities shall meet all applicable building and electrical codes.

9. 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*** (Document C) to the Utility and the EWS.

10. 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 and the EWS.

Part 2. TECHNICAL REQUIREMENTS

1. CHARACTER OF SERVICE:

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

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.

3. 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 EWS 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 ride through voltage fluctuations but shall automatically disconnect from Utility source if Utility or customer-owned generation voltage fluctuates beyond plus or minus 10% (ten percent). The Customer shall provide adequate protection to prevent damage to the Utility's electrical system from inadvertent over/under voltage conditions originating in Customer's Generating Facility and to protect the Customer's Generating Facility from inadvertent over/under voltage conditions originating from the Utility's electrical system.
c. Power output control system shall ride through frequency fluctuations but shall automatically disconnect from Utility if frequency fluctuates beyond plus or minus 2 cycles per second from 60 cycles per second (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.
f. The voltage produced by the Customer's Generating Facility must be balanced if it is a three-phase installation. The Customer is responsible for protecting the Generating Facility from an inadvertent phase unbalance in the Utility's service voltage.

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.

5. 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 Generating Facility and associated interconnection equipment to the Utility's Distribution System shall meet the applicable provisions of the following publications:

a. ANSI/IEEE1547-2003 Standard for Interconnecting Distributed Resources with Electric Power Systems (including use of IEEE 1547.1 testing protocols to establish conformity). The following standards shall be used as guidance in applying IEEE 1547:
    i. IEEE Std 519-2014, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
    ii. IEC/TR3 61000-3-7 Assessment of emission limits for fluctuating loads in MV and HV power systems
b. State of Colorado Electric Safety Code
c. ANSI/NFPA 70 (2014), National Electrical Code
d. OSHA (29 CFR § 1910.269)
e. Applicable regional transmission organization/independent system operator or transmission provider Tariff, Criteria, Business Practices, Protocols or other governing documents

Customer-Owned Generation
FACILITIES INTERCONNECTION AGREEMENT

This Agreement, (**"Agreement**") is entered into by and between the City of Yuma, Colorado ("**Utility**") and _____ ("**Customer**"). Customer and Utility are referenced in this Agreement collectively as **"Parties"** and individually as "**Party**."

Recitals

WHEREAS, Utility is a publicly-owned electric utility engaged in the retail sale of electricity in the state of Colorado,

WHEREAS, Customer owns or desires to install, own and operate an electric Generating Facility that qualifies as a Qualifying Facility under the Utility's ***Policy and Guidelines for Interconnection for Parallel Installation and Operation*** (adopted _____ date) and as allowed by federal and Colorado law;

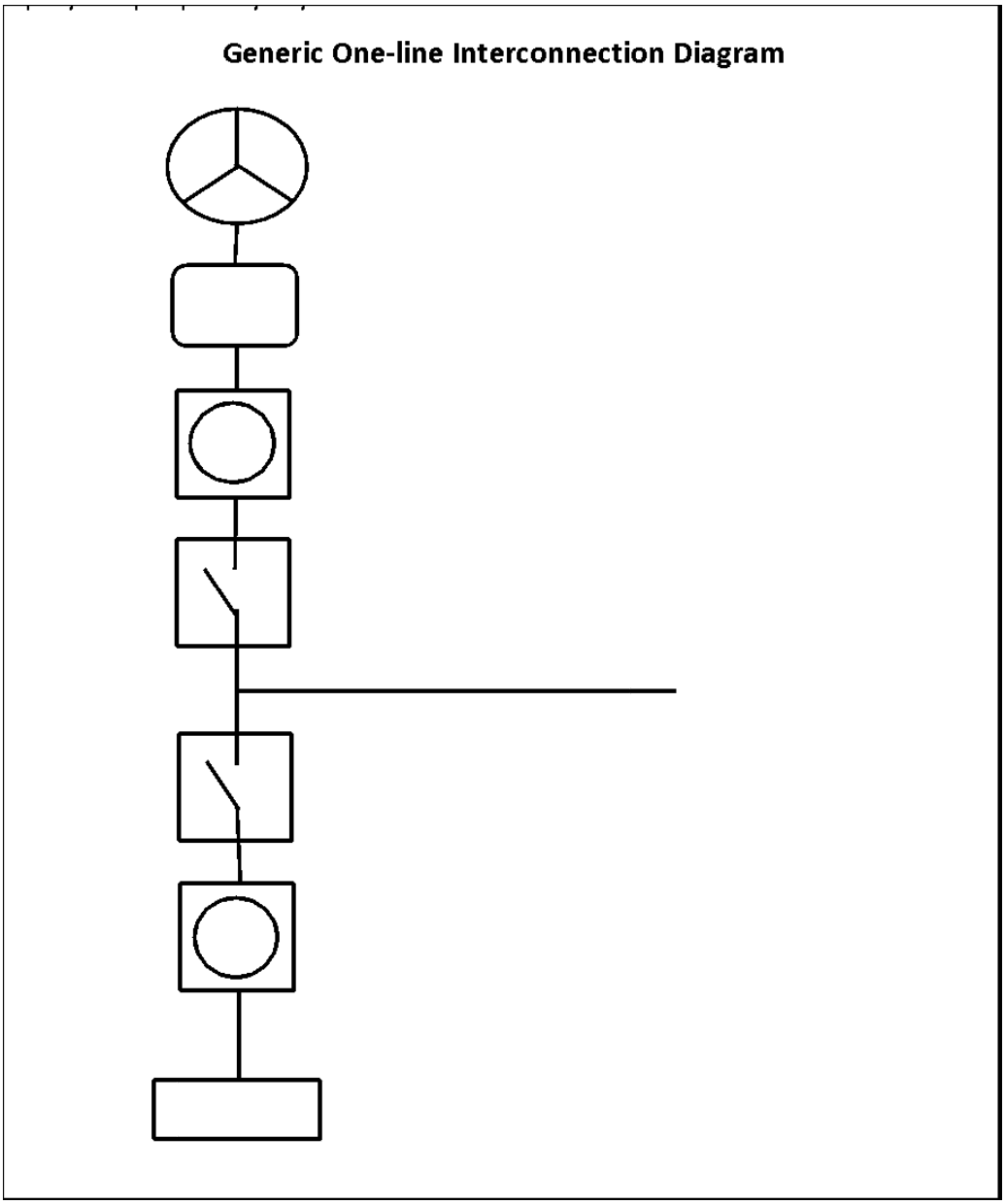
Agreement

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

1. SCOPE OF AGREEMENT
   This Agreement governs the terms and conditions under which the Customer's Generating Facility will interconnect with, and operate in parallel with, the Utility's electrical system.

2. 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 and receive a copy of the inspection from the State Electrical Division pursuant to Colorado law.

3. 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 on the attached document entitled "System Upgrade Estimated Costs". The Customer agrees to pay the costs upon receipt of the Utility's invoice within the timeframe indicated on the invoice. The diagram below shows the interconnection and metering requirements, ownership and responsibilities of the Parties.



4. BILLING OF NET EXCESS ENERGY

Customer Generators of greater than 10 kW-DC (Residential service) or greater than 25 kW-DC (Commercial or Industrial service) will be paid at the Utility's avoided cost rate for all excess energy (net excess energy) delivered to the Utility and will pay for all energy delivered to the customer at the Utility's retail rate. Customer Generators of 10 kW-DC or less (Residential service) or 25 kW-DC or less (Commercial or Industrial service) will be paid at the Utility's avoided cost rate for the net excess energy delivered to the Utility. Net excess energy for Customer Generators of 10 kW-DC or less (Residential service) or 25 kW-DC or less (Commercial or Industrial service) will be determined as the net amount of energy, if any, by which the output of the facility exceeds a customer-generator's total electricity requirements during a billing period. The Utility shall provide net metering for Customer Generators of 10 kW-DC or less (Residential service) or 25 kW-DC or less (Commercial or Industrial service), to the extent required by Colorado law.

The Electric Wholesale Supplier (EWS) for the Utility is the Municipal Energy Agency of Nebraska (MEAN). For a Generating Facility of 100 kW-DC or less: the EWS' current standard avoided cost rate, with adjustment noted below for losses, is the Utility's standard avoided cost rate that will be used to determine the monetary credits of the Customer's net excess energy month to month. See the Appendix, as amended from time to time. The net excess kWh will be multiplied by a loss factor of 5% representing the average distribution losses at the secondary level. If the Customer generator is metered at the primary voltage level the net excess kWh will be multiplied by a factor of 3%. For a Generating Facility of more than 100 kW-DC, the compensation rate will be determined on a case-by-case basis.

Utility may at its sole discretion elect to assign to EWS the Utility's rights to purchase any or all net excess output from the Generating Facility.

5. INTERRUPTION OR REDUCTION OF DELIVERIES

Utility may require Customer to interrupt or reduce deliveries and/or automatically isolate the facility from the electrical system when the Utility determines, in its sole discretion, that curtailment, interruption or reduction is necessary because of personnel safety, emergencies, Force Majeure or compliance with good utility practices.

6. ADVERSE OPERATING EFFECTS

The interconnection of the customer-owned Generating Facility shall not reduce the reliability and quality of the Distribution System. This includes, but is not limited to high levels of harmonics, abnormal voltage fluctuations and excessive frequency deviations. The Utility shall notify the Customer as soon as practicable if, based on Good Utility Practice, operation of the 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.

8. INDEMNITY AND LIABILITY

Each Party shall at all times indemnify, defend, and hold the other Party and its directors, officers, employees and agents, and the EWS and its directors, officers, employees, and agents, 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 indemnifying Party's action or failure to meet its obligations under this Agreement.

9. CONSEQUENTIAL DAMAGES

Other than as expressly provided for in this Agreement, no Party shall be liable under any provision of this Agreement for any losses, damages, costs or expenses for any special, indirect, incidental, consequential, or punitive damages, including but not limited to loss of profit or revenue, loss of the use of equipment, cost of capital, cost of temporary equipment or services, whether based in whole or in part in contract, in tort, including negligence, strict liability, or any other theory of liability; provided, however, that damages for which a Party may be liable

to the other Party under another agreement will not be considered to be special, indirect, incidental, or consequential damages hereunder.

10. GOVERNING LAW

This Agreement shall be interpreted and governed under the laws of the State of Colorado.

11. DOCUMENTS

The Agreement includes the following documents, which are attached and incorporated by reference:

A. Application for Interconnection
B. System Upgrade Estimated Costs
C. Certificate of Completion

12. NOTICES

All written notices shall be directed as follows:

UTILITY:	City of Yuma 320 South Main Street Yuma, CO 80759
CUSTOMER:	Name _____ Address _____ City_____
EWS:	Municipal Energy Agency of Nebraska Wholesale Electric Division 8377 Glynoaks Drive Lincoln, NE 68516

13. 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.

[SIGNATURE PAGE FOLLOWING]

IN WITNESS WHEREOF, the Parties hereto have caused two originals of the Customer-Owned Generation Facilities Interconnection Agreement to be executed by their duly authorized representatives.

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

(CUSTOMER)	**City of Yuma, Colorado**
Signature_____	Signature _____
Print Name _____	Print Name _____
Title _____	Title _____
Date _____	Date _____

Document A
Application for Interconnection

This Application 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

A non-refundable processing fee of $250 must accompany this Application for 25kW-DC and less generators. The fee is $500 for over 25 kW-DC generators.

Customer

Name: _____

Contact Person: _____

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: _____

Owner of the facility: _____

Generating Facility Information

Location (if different from above): _____

Local Electric Utility: City of Yuma, Colorado

Account Number: _____

Inverter Manufacturer: _____

Model: _____

Nameplate Rating: _____ (kW) _____ (kVA)

(AC Volts) Single Phase _____ Three Phase _____

System AC Design Capacity: _____ (kW) _____ (kVA)

Prime Mover: Photovoltaic □ Reciprocating Engine □ Fuel Cell □

Turbine □ Other _____

Energy Source: Solar □ Wind □ Hydro □ Methane □ Biomass □

Geo Thermal □ Hydro Power □

Other (describe) (Diesel, Natural Gas, Fuel Oil) _____

Is the equipment UL1741 Listed? Yes_____ No_____

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

Does the equipment meet IEEE 1547 specifications? Yes____ No_____

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.	_____	_____

The customer is required to install a meter socket that meets the EWS specification between the Inverter and the AC connection to the customer's load panel. The EWS will cause to be installed an interval recording meter to record net generator power output. The Utility shall have the right to install such additional metering equipment as it deems necessary for the collection of data for research purposes, which metering will be furnished and paid for by the Utility.

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.

Signed: _____

Title: _____ Date: _____

Contingent Approval to Interconnect the Generating Facility

Interconnection of the Generating Facility is approved contingent upon the terms and conditions of the Utility's Interconnection Standard Inspection and upon return of the Certificate of Completion.

Utility Signature: _____

Title: _____ Date: _____

Copies: Customer, Utility, EWS

Document B
System Upgrade Estimated Costs

System Upgrade(s) Required	Cost Estimate
Total:	

Document C
Certificate of Completion

Customer Declaration:

Is the Generating Facility installed, tested and ready for operation? Yes_____ No_____

Customer: _____

Contact Person: _____

Address: _____

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

Address: _____

City: _____ State: _____ Zip Code: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

Electrician/Service Company:

Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

License Number: _____

Date "Contingent Approval to Interconnect the Generating Facility" granted by the Utility (See Document A): _____

Inspection:

The Generating Facility has been installed and inspected in compliance with the local building and electrical codes 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 the Utility:

Name: _____

Electric Utility: City of Yuma

Address: 910 South Main Street

City, State, ZIP: Yuma, CO 80759

Fax: _____ E-Mail Address: _____

Approval to Energize the Renewable Generating Facility
Energizing the Generating Facility is approved:

Utility Signature: _____

Title: _____ Date: _____

Copies: Customer, Utility, EWS

Appendix
Avoided Cost Rate
(Less than or equal to 100 kW)

Avoided Cost Rate: $0.04209 per kWh

Effective date: January 1, 2022

(Rate is subject to change)

MEAN Signature: _____

Title: _____ Date: _____