

# FELPS

**FLORESVILLE ELECTRIC  
LIGHT & POWER SYSTEM**

**DISTRIBUTED GENERATION  
GUIDELINES MANUAL**

**UPDATED MAY-2021**

## Introduction

Distributed Generation (DG) technologies continue to develop and have reached a level of cost-effectiveness that has led an increasing number of energy consumers to consider the installation of DG systems, especially renewable DG systems. Floresville Electric Light & Power System (FELPS) has developed the policies and procedures contained in this Guidelines Manual to ensure DG installations in the FELPS service area **meet procedural, technical, and operational requirements for the safe interconnection and parallel operation of these systems on the FELPS electric distribution system.**

This Distributed Generation Guidelines Manual (DG Guidelines Manual) is intended to provide customers with accurate procedural, technical and policy information that will assist and guide customers through the interconnection process and support informed decisions at every stage or phase of this process.

The DG Guidelines Manual is organized in the following manner:

Section	Purpose
<b>Overview - Q&amp;A</b>	Answer basic questions that customers will likely ask / need to know prior to starting on a DG project.
<b>Definitions</b>	Define the main terms associated with DG, to ensure customers understand the terms that are associated with the FELPS's DG policies, procedures, and requirements.
<b>Interconnection Process and System Requirements</b>	Engineering-based technical requirements and specifications that all DG systems must meet prior to installation / interconnection of the DG system and the process and policy requirements that must be satisfied to interconnect a DG system with the FELPS distribution system.
<b>Application Form</b>	The form that must be completed and provided to the FELPS prior to a customer beginning the process to install a DG system.
<b>DG Agreement(s)</b>	The agreement between the FELPS and a customer that desires to install, interconnect and operate a DG system in parallel with the FELPS's distribution system.
<b>DG Interconnection Diagrams</b>	Diagrams that illustrates key installation and interconnection requirements for all DG systems.
<b>DG Rate Rider</b>	The FELPS DG Rate tariff applies to DG systems that is operational and interconnected with FELPS electric distribution system.

# FELPS

*Distributed Generation  
Guidelines Manual*

*Overview / Q&A Section*

## **What is the purpose of the FELPS Distributed Generation (DG) Interconnection Guide?**

*FELPS developed Distribution Generation Guidelines that establish the requirements for interconnection and parallel operation of distributed generation facilities within the Floresville Electric Light & Power System (FELPS) service area and prohibits the interconnection and/or parallel operation of distributed generation systems not in compliance with this policy.*

*The FELPS DG Guidelines are consistent with the Texas Public Utility Commission's (PUC) DG rules and regulations (P.U.C. SUBST. R. 25.211, 25.212 and 25.217) as well as other statutory guidelines, including the Texas Public Utilities Regulatory Act (PURA), which entitles all Texas electric customers to access to on-site distributed generation, and authorizes the interconnection and parallel operation of Distributed Renewable Generation with electric utilities.*

*The FELPS DG Interconnection Guide provides information to FELPS' customers desiring to install and interconnect a DG system on the FELPS electric distribution system have all the technical and procedural information needed to have a full understanding of the requirements involved with this process.*

*The Guide also provides information for FELPS customers regarding the rate that FELPS has put in place to purchase any energy that is delivered to the FELPS distribution system.*

***The bottom line: FELPS is committed to the safe interconnection and operation of all DG installations on the FELPS distribution system.***

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## ***I am a FELPS customer and considering installing a DG system - where do I need to start?***

*FELPS' customers should **contact FELPS very early in the decision/installation process.** Our representatives will be glad to take time to answer questions and provide both technical and procedural information regarding your potential DG installation. The FELPS DG Policy is clear – DG systems will not be allowed to interconnect and/or operate until the following steps have occurred:*

*Step-1: **Customer must apply to FELPS for the installation and interconnection of a DG system(s).** The FELPS DG Application Form is attached to the FELPS DG Interconnection Guide – and is also available on the FELPS website (FELPS.us) and at the FELPS office. An application fee of \$250.00 will be assessed.*

*Step-2: The **DG application must be reviewed and approved by FELPS, prior to installation of the DG system.** FELPS must confirm that the proposed system meets the technical requirements and if the installation requires an engineering study. In some cases, engineering studies are required to ensure the safe operation of the DG system.*

**Step-3: Once the DG system is installed FELPS will confirm the installation is consistent with the DG Application and meets all FELPS DG requirements.** This inspection must take place prior to interconnecting the DG system with the FELPS distribution system. The first trip is included in the application fee. Any additional trips will be charged at \$100.00 per trip.

**Step-4: The customer must execute a DG Agreement with FELPS.** This agreement is required prior to interconnecting the DG system with the FELPS distribution system. The DG agreement confirms that the system meets all technical requirements and sets the rate at which FELPS will purchase any energy that is delivered to FELPS (in excess of the DG output that is used by the customer).

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## **What are the technical specification and requirements for the interconnection of a DG system?**

The term “technical requirements” can be a little confusing in terms of the DG application, installation, and agreement process. Here are some key things to know and consider regarding technical requirements:

- FELPS has adopted the technical requirements and specifications from the PUC DG Rule. These specifications set forth the requirements for the safe interconnection and operation of DG systems. These requirements also establish the criteria used to determine if an engineering study is needed.
  - Many technical requirements are covered by having “pre-certified” equipment with appropriate IEEE, UL and other “stamps of approval” from the DG system manufacturer. For most systems, these certifications signal to FELPS that the system being installed meets and/or exceeds technical requirements for the major components of the system (e.g., the solar panels and inverter(s)).
  - There are also technical requirements related to the installation. FELPS has provided a summary of all the requirements (technical and procedural) from the FELPS DG Policy (and the DG Application and DG Agreement are attached to the DG Interconnection Guide).
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## **Does FELPS sell and / or install DG systems?**

### **Does FELPS have listed DG vendors or contractors?**

FELPS realizes that some electric utilities have decided to be in the business of selling and installing some types of DG systems. However, FELPS has determined that selling and/or installing DG systems is not a business that aligns with the FELPS mission at this time. Given our large and growing service area and our limited resources, our efforts are best directed at the safe and reliable operation and maintenance of our distribution system and the related service to our customers.

FELPS understands that our customers look to us for sound and unbiased information, and with that in mind – we can provide general information to our customers regarding distributed generation,

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*but FELPS will not endorse or recommend systems, vendors or contractors for DG system installations.*

### ***How will FELPS account for (and reimburse) for energy that my DG system sends to the electric grid?***

*FELPS will reimburse customers for energy “delivered to” the FELPS system at the avoided cost of generation rate (ACGR). The ACGR is determined by the average per KWh cost of wholesale generation costs for electric energy purchased by FELPS from its wholesale electric energy provider(s). FELPS reserves the right to amend the ACGR at any time.*

*The FELPS DG Rate Rider (attached to this Interconnection Guide) contains all relevant information regarding the rate for accounts with interconnected DG systems.*

# FELPS

*Distributed Generation  
Guidelines Manual  
Definitions*

## **DG Definitions**

1. **Automatic Disconnect Device:** A switch that is capable of opening and closing automatically at the Point of Interconnection that provides clear indication of the switch position, and when in the open position isolates the distributed generation Battery Storage System.
2. **Avoided Cost of Generation Rate (ACGR):** The rate FELPS will reimburse customers with interconnected DG systems that send energy to the FELPS's distribution grid. The ACGR is based on the FELPS's cost of wholesale energy.
3. **Battery Storage System:** Technology developed for storing electric charge by using specially developed batteries so the stored energy can be utilized at a later time. The system typically utilizes an electro-chemical solution and includes batteries, inverters, and disconnect switches. The system may be connected to and serve critical loads when utility power is unavailable.
4. **Customer:** a person or entity interconnected or seeking interconnection to the FELPS electric system for the purpose of receiving or exporting electric power from or to the FELPS electric system.
5. **DG Agreement:** An agreement between a customer and the FELPS that sets forth the contractual conditions under which a company and a customer agree that one or more facilities may be interconnected with the FELPS's electric system.
6. **DG Application:** The form of application of a customer seeking interconnection and parallel operation of distributed generation with the FELPS's electric system.
7. **Distributed Generation (DG):** An electrical generating facility located at a customer's point of delivery (point of common coupling) of ten (10) megawatts (MW) or less and connected at a voltage less than sixty (60) kilovolts (kV) which may be connected in parallel operation to the FELPS electric system. Examples of DG include, but are not limited to, systems that generate or store energy such as solar photovoltaic, wind, energy storage, combined heat and power, fuel cells, batteries, micro-turbines, reciprocating engines, gas, and diesel generators
8. **Distributed Generation System Capacity Charge (DGSCC):** The monthly charge applied to customers with interconnected DG systems that is based on the installed capacity of the DG system.
9. **Distributed Generation Owner:** An owner of distributed generation, the customer on whose side of the meter distributed generation is installed and operated, regardless of whether the customer takes ownership of the distributed generation, or a person who by contract is assigned ownership rights to energy produced from distributed generation located at the premises of the customer on the customer's side of the meter.



10. **Energy Delivered:** Electric energy, measured in kWh, sent / delivered to the Customer (premise) by FELPS.
11. **Energy Received:** Electric energy, measured in kWh, sent / delivered to the FELPS distribution system by the DG customer.
12. **ERCOT:** The Electric Reliability Council of Texas, Inc., or successor independent organization under Public Utility Regulatory Act ("PURA") §39.151 for the power region to which the FELPS electric system is connected.
13. **FELPS Chief Executive Officer:** The FELPS Chief Executive Officer and/or his/her duly authorized representative.
14. **FELPS Contact Person:** The person or persons designated by the FELPS Chief Executive Officer to serve as the FELPS's contact for all matters related to distributed generation interconnection.
15. **IEEE Standard 1547:** Standard for Interconnection of Distributed Generation with Electrical Power Systems, establishes the technical requirements for interconnecting all types of distributed generation equipment with the electrical distribution system. Also establishes requirements for the testing, performance, maintenance, and safety of the interconnection, as well as responses to abnormal events, anti-islanding protection, and power quality. IEEE 1547 consists of a series of standards and guidelines dealing with various aspects of interconnecting distribution power sources to the utility system. This standard provides universal requirements to help ensure a safe and technically sound interconnection.
16. **Interconnection:** The physical connection of distributed generation to the utility system in accordance with the requirements of this ordinance so that parallel operation can occur.
17. **Manual Disconnect Device:** A manual switch at the Point of Interconnection that provides clear indication of the switch position, and when in the open position isolates the distributed generation from load unrelated to generation of electricity or operation of the facility.
18. **Networked Secondary:** Two or more utility primary distribution feeder sources electrically tied together on the secondary (low voltage) side to form one power source for one or more customers. The service is designed to maintain service to the customers even after the loss of one of these primary distribution feeder sources.
19. **Parallel Operation:** The operation of distributed generation by a customer while the customer is connected to the FELPS electric system.
20. **Public Utility Commission of Texas (PUCT):** The Public Utility Commission of Texas is a state agency that regulates the state's electric, water and telecommunication utilities, implements respective legislation, and offers customer assistance in resolving consumer complaints.

21. **Point of Interconnection (Point of Service, Point of Common Coupling):** The point where the electrical conductors of the FELPS utility system are connected to the customer's conductors and where any transfer of electric power between the customer and the FELPS utility system takes place.
22. **Pre-certified Equipment:** A specific generating and protective equipment system or systems that have been certified as meeting the applicable parts of these guidelines relating to safety and reliability by an entity.
23. **Pre-interconnection Study:** A study or studies that may be undertaken by the FELPS in response to its receipt of a completed DG Application. Pre-interconnection studies may include, but are not limited to, service studies, coordination studies and utility system impact studies.
24. **Stabilized:** The FELPS electric system shall be considered stabilized when, following a disturbance, the system returns to the normal range of voltage and frequency for a duration of two minutes.
25. **UL 1741:** Addresses the requirements for all types of DG equipment, including inverters, charge controllers, and combiner boxes used in PV systems, as well as equipment used for the interconnection of wind turbines, fuel cells, microturbines, and engine-generators. This standard covers requirements for the utility interface and is intended to supplement and be used in conjunction with IEEE 1547. The products covered by the UL 1741 listing are intended to be installed in accordance with the NEC, NFPA 70.

# FELPS

*Distributed Generation  
Guidelines Manual*

***Interconnection Process and  
System Requirements***

## **Interconnection Process and System Requirements**

1. Before a person or entity may interconnect or operate in parallel a distributed generation system within the FELPS electric system, that person or entity must apply to FELPS by completing a FELPS DG Application Form and execute a DG Agreement with FELPS that establishes the terms and conditions for the interconnection and parallel operation of the distributed generation system.
2. The Chief Executive Officer of FELPS has the authority to execute Agreements with Customers for the interconnection and parallel operation of distributed generation within the FELPS electric system in accordance with this DG Policy, the PUCT rules and regulations, and in accordance with all state and federal laws applicable.
3. The interconnection shall not be energized prior to the execution of the Agreement as required herein.
4. The FELPS contact person or persons for all matters related to distributed generation interconnection is provided on the FELPS DG Handout (attached). The FELPS internet web site has information for the distributed generation contact person or persons.
5. The designated FELPS DG contact person (FELPS DG Project Coordinator) shall review applications for distributed generation with attached technical documentation and determine compliance with the FELPS technical requirements for interconnection and parallel operation of distributed generation.
6. When FELPS is satisfied that the customer has complied with the application requirements and that the DG system complies with the technical requirements for interconnection and parallel operation of distributed generation, the FELPS DG contact person (FELPS DG Project Coordinator) shall recommend to the FELPS Chief Executive Officer, that an Agreement be executed with the Customer for the interconnection and parallel operation of distributed generation.
7. All DG interconnections shall comply with PUC SUBST. R. 25.212 and successors. In addition, all DG interconnections shall comply with applicable state and federal laws and regulations.
8. All DG interconnections shall comply with local building and electric codes. Building codes are enforced by the local entity responsible for code enforcement. Installation of all interconnections shall be inspected by FELPS to ensure compliance with FELPS DG specifications and requirements. Inspection and approval of the installation by FELPS is a condition of interconnection and parallel operation of distributed generation.
9. Variations from the technical requirements herein must be reviewed and approved by FELPS prior to implementation. Variations in the point of interconnection must be approved and included in the Agreement approved by the FELPS Chief Executive Officer.
10. The customer shall provide and install a manual load break switch that provides clear indication of the switch position at the Point of Interconnection to provide separation between the FELPS electrical system and the customer's electrical generation system. The location of the disconnect switch must be approved by FELPS. The disconnect switch shall be easily visible, mounted separately from metering equipment, readily accessible to FELPS personnel at all times, and capable of being locked in the open position with a FELPS padlock. FELPS reserves the right to open the disconnect switch isolating the customer's electrical generating system (which may or may not include the customer's load) from FELPS electrical system for the following reasons:

- 10.1. To facilitate maintenance or repair of the FELPS electrical system.
  - 10.2. When emergency conditions exist on the FELPS electrical system.
  - 10.3. When the customer's electrical generating system is determined to be operating in a hazardous or unsafe manner or unduly affecting the FELPS electrical system waveform.
  - 10.4. When the customer's electrical generating system is determined to be adversely affecting other electric consumers on the FELPS electrical system.
  - 10.5. Failure of the customer to comply with applicable codes, regulations and standards in effect at the time.
  - 10.6. Failure of the customer to abide by any contractual arrangement or operating agreement with FELPS.
11. Power Quality Specifications / Requirements:
- 11.1. Voltage – FELPS shall endeavor to maintain the distribution voltages on the electrical system but shall not be responsible for factors or circumstances beyond its control. The customer shall provide an automatic method of disconnecting generation equipment from the FELPS electrical system within 10 cycles should a voltage deviation greater than +5% or -10% from normal be sustained for more than 30 seconds (1800 cycles) or a voltage deviation greater than +10% or -30% from normal be sustained for more than 10 cycles. If high or low voltage complaints or flicker complaints result from the operation of the customer's electrical generation, the customer's generating system shall be disconnected until the problem is resolved.
  - 11.2. Frequency – FELPS shall endeavor to maintain a 60-hertz nominal frequency on the electrical system. The customer shall provide an automatic method of disconnecting generation equipment from the FELPS electrical system within 15 cycles should a deviation in frequency of +0.5Hz or -0.7Hz from normal occur.
  - 11.3. Harmonics – In accordance with IEEE 519, the total harmonic distortion (THD) of voltage shall not exceed 5% of a pure sine wave of 60-hertz frequency or 3% of the 60-hertz frequency for any individual harmonic when measured at the point of interconnection with the FELPS electrical system. Also, the total current distortion shall not exceed 5% of the fundamental frequency sine wave. If harmonics beyond the allowable range result from the operation of the customer's electrical generation, the customer's generating system shall be disconnected until the problem is resolved.
  - 11.4. Flicker – The distributed generation facility shall not cause excessive voltage flicker on the FELPS electrical system. This flicker shall not exceed 3% voltage dip, in accordance with IEEE 519 (Section 10.5), as measured at the point of interconnection.
  - 11.5. Power factor – The customer's electrical generation system shall be designed, operated and controlled at all times to provide reactive power requirements at the point of interconnection from 0.97 lagging to 0.95 leading power factor. Induction generators shall have static capacitors that provide at least 97% of the magnetizing current requirements of the induction generator field. FELPS may, in the interest of safety, authorize the omission of capacitors. However, where capacitors are used for power factor correction, additional protective devices may be required to guard against self-excitation of the customer's generator field.

## 12. Loss of Source:

- 12.1. The customer shall provide approved protective equipment necessary to immediately, completely and automatically disconnect the customer's electrical generation equipment from the FELPS electrical system in the event of a fault on the customer's system, a fault on the FELPS system or loss of source on the FELPS system. Such protective equipment shall conform to the criteria specified in UL 1741 and IEEE 1547. The customer's generating system shall automatically disconnect from the grid within 10 cycles if the voltage on one or more phases falls and stays below 70% of nominal voltage for at least 10 cycles. The automatic disconnecting device may be of the manual or automatic reclose type and shall not be capable of reclosing until after the FELPS service voltage and frequency are restored to within the normal operating range and the system is stabilized.

## 13. Coordination and Synchronization

- 13.1. The customer shall be solely responsible for coordination and synchronization of the customer's electrical generating system with all aspects of the FELPS electrical system, and the customer assumes all responsibility for damage or loss that may occur from improper coordination and synchronization of its generating system with the FELPS electrical system.

## 14. Metering / Meter Socket

- 14.1. The actual metering equipment required, its voltage rating, number of phases and wires, size, current transformers, number of input and associated memory is dependent upon the type, size and location of the electric service provided. The Customer shall pay for the installation of the data recorder (meter) that is capable of measuring the "Delivered KWh" (energy delivered by FELPS); the "Received KWh" (energy delivered to FELPS by the Customer) using a single meter or two-meter configuration. Additionally, for all Customers, FELPS reserves the right to install, at its own expense, a meter to measure the output of the DG system.
- 14.2. The Customer shall install a meter socket for a meter to measure the output of the DG system. Customer shall pay for the socket and the installation of the socket.

## 15. Interconnection Study

- 15.1. FELPS will determine whether an interconnection study is necessary, based on relevant engineering factors including the output of the system, the location of the system and other FELPS distribution system factors. If the interconnection study is deemed necessary, FELPS shall perform the study under reasonable terms and conditions agreed upon by both the customer and FELPS and at the customer's sole expense. No study fee will be charged if the proposed generation site is not on a networked secondary and if all of the following apply:
- 15.2. Proposed generation equipment is pre-certified
  - 15.2.1. Generation equipment that are less than 15 kW AC shall be considered pre-certified if system meets appropriate codes and standards provided by NESC (National Electrical Safety Code), ANSI (American National Standards Institute), IEEE (Institute of Electrical and Electronic Engineers), NEC (National Electric Code), UL (Underwriter's Laboratory), technical requirements and local building codes and other applicable ordinances in effect at the time of the installation of the DG system.

15.2.2. Proposed generation system does not expect to export more than 15% of total load on the feeder.

15.2.3. Proposed generation system does not contribute more than 25% of the maximum possible short circuit current of the feeder.

## 16. Protection

16.1. The distributed generation facility must have interrupting devices capable of interrupting the maximum available fault current, an interconnection disconnect device, a generator disconnect device, an over-voltage trip, an under-voltage trip, an over/under frequency trip and a manual or automatic synchronizing check (for facilities with standalone capability). Facilities rated over 10kW, three-phase, must also have reverse power sensing and either a ground over-voltage or a ground over-current trip depending on the grounding system. Grounding shall be done in accordance with UL 1741, IEEE 1547 and NEC Article 250.

## 17. Three-Phase generators

### 17.1. Synchronous machines:

17.1.1. The distributed generation facility's circuit breakers shall be three-phase devices with electronic or electromechanical control.

17.1.2. The Customer is solely responsible for proper synchronization of its generator with the FELPS system.

17.1.3. The excitation system response ratio shall not be less than 0.5.

17.1.4. The generator's excitation system shall conform to the field voltage versus time criteria specified in ANSI Standard C50.13-1989.

17.2. Induction machines: The induction machines used for generation may be brought up to synchronous speed if it can be demonstrated that the initial voltage drop at the point of interconnection is within the flicker limits specified in this document.

## 18. Inverters:

18.1. Line-commutated inverters do not require synchronizing equipment.

18.2. Self-commutated inverters require synchronizing equipment.

## 19. Standards

19.1. The distributed generation equipment shall be designed, installed, operated and maintained in accordance with, but not limited to, ANSI standards, UL standards, IEEE standards, the National Electrical Code, ERCOT Operating Guides and any other applicable local, state or federal codes and statutes. In the case of a conflict between the requirements in this document and any of those standards or codes, this document shall prevail.

## 20. Violations

20.1. Any person violating this DG Policy by interconnecting distributed generation to the FELPS electric system without a complete Application and executed Agreement shall have the DG system disconnected from the FELPS distribution system, until all violations have been corrected to the satisfaction of FELPS.

# FELPS

*Distributed Generation  
Guidelines Manual  
Application Form*



## APPLICATION AND CUSTOMER INFORMATION

This application is for the coordination of interconnection of a distributed generation (DG system) between "Customer", Floresville Electric Light & Power System (FELPS) and the electrician / contractor doing the proposed work. The following needs to be filled out completely and clearly.

<b>Date</b>	
<b>First Name (Customer)</b>	
<b>Last Name (Customer)</b>	
<b>Account Number</b>	
<b>Premise / Account Type</b>	<input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Other
<b>Phone</b>	
<b>Email</b>	
<b>Installation Address</b> (physical address)	

## INSTALLATION AND SYSTEM INFORMATION

<b>Installer / Company Name</b>			
<b>Phone</b>			
<b>Email</b>			
<b>Project Contact Person</b>			
<b>System DC (kW)</b>		<b>System Continuous AC (kW)</b>	
<b>(If Solar DG) Panel Manufacturer / Number of Panels</b>			
<b>Inverter Manufacturer and Model / Number of Inverters</b>			
<b>Does system have a battery backup?</b>	<b>Yes</b>	<b>No</b>	(please circle one)
<b>If battery – provide manufacturer / model information</b>			

## INSTALLATION AND SYSTEM INFORMATION (CONTINUED)

IEEE and/or UL Certification(s) (list all)	
Please provide the system engineering and/or manufacturers drawings and specifications	<input type="checkbox"/> System one-line diagram <input type="checkbox"/> Additional system documentation

## INFORMATION PREPARED AND SUBMITTED BY

First Name	
Last Name	
Signature	
Date	

## RETURN COMPLETED APPLICATION TO

### Floresville Electric Light & Power System

*Mailing address:*

187 State Highway 97 E  
Floresville, TX 78114

*Physical address:*

187 State Highway 97 E  
Floresville, TX 78114

**Office (830) 216-7000**

Press 1 for English or press 2 for Spanish

**Attention: FELPS Customer Service**

[CustomerService@felps.us](mailto:CustomerService@felps.us)

(830) 216-7000 sub-option 1

# FELPS

*Distributed Generation  
Guidelines Manual*

***Agreement for Interconnection  
and Parallel Operation of  
Distributed Generation***

## DISTRIBUTED GENERATION AGREEMENT

FOR THE INTERCONNECTION AND PARALLEL OPERATION OF DISTRIBUTED GENERATION IN THE FELPS ELECTRIC SYSTEM

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THIS AGREEMENT is entered into by and between the Floresville Electric Light & Power System (FELPS) and \_\_\_\_\_ Customer (Customer).

FELPS owns and operates an electric utility engaged in the distribution of electricity serving portions of Wilson, Bexar and Karnes Counties, including the cities of Floresville, Stockdale, Poth, Falls City, and La Vernia, as well as the unincorporated communities of Saspamco, Sutherland Springs, Pandora, Denhawken, Koscuisko, Cestohowa, Pawelekville, and Hobson; and Customer intends to construct, own, operate, maintain and connect to the FELPS electric distribution system, a Distributed Generation system less than 10MW in size (the DG System) at address:

\_\_\_\_\_; and the parties hereto wish to contract for the purchase and sale of the electrical output from the DG System, and the terms of its interconnection with the FELPS electric distribution system. THEREFORE, in consideration of the mutual covenants and agreements herein contained, the parties hereby contract and agree with each other as follows:

**Article 1.0** | This Agreement shall be effective as of the date of execution by the latter of the two parties (the Effective Date) and, subject to the other terms of this Agreement, shall continue in effect for a period of one year, and month to month thereafter.

**Article 2.0** | The DG System will be installed at Customer's premises at the address specified above. The DG System shall not have a generation capacity greater than 10 MW. Customer shall install, operate and maintain the DG System in full and faithful compliance with all applicable federal, state and local laws, ordinances, rules and regulations, and generally accepted industry codes and standards, including, but not limited to the National Electrical Safety Code and the National Electrical Code. Customer shall promptly notify FELPS upon receipt of any citation or other official notice of alleged violation of laws, ordinances, rules and regulations concerning the DG System.

**Article 3.0** | Customer warrants and represents that:

**3.01** | The information regarding the characteristics of the DG System are as specified in the Application for Interconnection and Parallel Operation of Distributed Generation with the FELPS Electric System filed by the Customer with FELPS;

**3.02** | The DG System and associated other electrical components and devices meet National Electrical Code standards;

**3.03** | All permits, inspections, approvals, and/or licenses necessary for the installation or operation of the DG System have been obtained; and Section 6.04. The DG System has been successfully tested to UL 1741 and IEEE 1547 standards, or has been satisfactorily tested by an independent laboratory with published results.

**3.04** | Customer shall provide manufacturer's data or other written proof acceptable to FELPS to verify the accuracy of the foregoing warranties and representations. If any of foregoing warranties and representations are inaccurate, FELPS may, without waiver of or prejudice to any other remedy, immediately disconnect the DG system from the FELPS electric system and terminate this agreement.

## DISTRIBUTED GENERATION AGREEMENT

### FOR THE INTERCONNECTION AND PARALLEL OPERATION OF DISTRIBUTED GENERATION IN THE FELPS ELECTRIC SYSTEM

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**Article 4.0** | FELPS will purchase from Customer and Customer will sell exclusively to FELPS the electrical output from the DG system that is “received” by the FELPS Distribution System. During the term of this Agreement, Customer shall exclusively purchase from FELPS its requirements of electric energy above the amounts generated by the DG system.

**Article 5.0** | As provided for in the FELPS DG Rate Rider, FELPS shall pay customer (via a credit on monthly electric bill or other form of payment) for the “KWh Received” (energy received by the FELPS Distribution System) at the “Avoided Cost of Generation Rate” (ACGR). The ACGR is determined by the average per KWH cost of wholesale generation costs for electric energy purchased by FELPS from its wholesale electric energy provider(s). FELPS reserves the right to amend the ACGR at any time.

**Article 6.0** | Customer shall pay for the installation of the data recorder (meter) that is capable of measuring the “KWh Delivered” (energy delivered to the Customer) and the “KWh Received” (energy received by the FELPS Distribution System) in intervals established by FELPS. Customer is required to install a meter socket for a meter to measure the output of the DG system.

**Article 7.0** | Customer shall be solely responsible for the design, installation, operation, maintenance, and repair of the DG System and Customer's interconnection facilities. The interconnection of the DG System to the FELPS electrical system shall comply with the Public Utility Commission of Texas Substantive Rules §25.212 relating to Technical Requirements for Interconnection and Parallel Operation of On-Site Distributed Generation, (16 Texas administrative Code §25.212) or any successor rule addressing distributed generation. FELPS shall inspect the DG System and the interconnection equipment. All costs to interconnect with the FELPS electric system shall be the responsibility of Customer. FELPS shall not be required to take or pay for any energy generated by the DG System until the DG System successfully passes FELPS’ Field Inspection and Customer shall have reimbursed FELPS for all its interconnection costs. Maintenance of the DG System shall be performed in accordance with the applicable manufacturer's recommended maintenance schedule.

**Article 8.0** | FELPS shall not be obligated to accept, and shall have the right to require Customer to temporarily curtail, interrupt, or reduce, deliveries of energy in order to construct, install, maintain, repair, replace, remove, investigate, inspect, or test any part of the interconnection facilities, equipment, or any part of the FELPS electric system. FELPS may disconnect, without notice, the DG System from the electric distribution system, if, in FELPS’ opinion, a hazardous condition exists and such immediate action is necessary to protect persons, or FELPS’ facilities or other customers' facilities from damage or interference caused by Customer's DG System or lack of properly operating protective devices.

**Article 9.0** | Customer hereby grants FELPS access on and across its property at any reasonable time to inspect the DG System and the interconnection equipment, to read or test meters and metering equipment, and to operate, maintain and repair FELPS’ facilities. No inspection by FELPS of the DG System or the interconnection facilities shall impose on FELPS any liability or responsibility for the operation, safety or maintenance of the DG system or Customer's interconnection facilities.

**DISTRIBUTED GENERATION AGREEMENT**

FOR THE INTERCONNECTION AND PARALLEL OPERATION OF DISTRIBUTED GENERATION IN THE FELPS ELECTRIC SYSTEM

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**Article 10** | Customer shall indemnify, defend and save harmless FELPS, its elected and non-elected officials, officers, agents and employees from and against any and all liabilities, losses, claims, damages, actions, suits or demands for damages (including costs and attorney's fees, both at trial and on appeal) arising out of, resulting from, or in any manner connected with the breach of any warranty or representation made by Customer in this Agreement, or in any manner connected with the design, construction, operation, maintenance or repair of any part of Customer's DG System or interconnection facilities, including, without limitation liabilities, losses, claims, damages, actions, suits or demands for damages for or on account of personal injury to, or death of, any person, or damage to, or destruction or loss of, property belonging to Customer, FELPS or any third person.

**Article 11** | No additional liability insurance shall be required by FELPS for the interconnection. Customers are encouraged to review the liability requirements of the interconnection agreement and to provide adequate insurance.

**Article 12** | Notices given under this Agreement are deemed to have been duly delivered if hand delivered or sent by United States certified mail, return receipt requested, postage prepaid, to:

**If to Company:**

Floresville Electric Light & Power System  
187 State Highway 97 E  
Floresville, TX 78114

**If to Customer:**

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The above-listed names, titles, and addresses of either party may be changed by written notification to the other.

**Article 13** | A material failure of either party to fully, faithfully and timely perform its obligations under this Agreement shall be a breach of this Agreement. In the event of a breach which is not cured within thirty (30) days after receipt of written notice to the party in default, the party not in default may terminate this Agreement. If Customer is in breach of this Agreement, and such breach continues for thirty (30) days after written notice from FELPS, FELPS may disconnect the DG System or otherwise suspend taking energy from Customer. All rights granted under this section are in addition to all other rights or remedies available at law or under this Agreement or the applicable FELPS Utilities Rules and Regulations.

**DISTRIBUTED GENERATION AGREEMENT**

FOR THE INTERCONNECTION AND PARALLEL OPERATION OF DISTRIBUTED GENERATION IN THE FELPS ELECTRIC SYSTEM

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**Article 14** | This Agreement shall inure to the benefit of and be binding upon the heirs, successors, or assigns of each of the parties hereto. Customer may not assign this Agreement without the prior written consent of FELPS. Any assignment without such consent shall be null and void.

**Article 15** | This Agreement constitutes the entire agreement and understanding between the parties hereto and can be amended only by agreement between the parties in writing. In the event any provision of this Agreement, or any part or portion thereof, shall be held to be invalid, void or otherwise unenforceable, the obligations of the parties shall be deemed to be reduced only as much as may be required to remove the impediment.

**Article 16** | The failure of either party to insist in any one or more instances upon strict performance of any provisions of this Agreement, or to take advantage of any of its rights hereunder, shall not be construed as a waiver of any such provision or the relinquishment of any such right or any other right hereunder.

**Article 17** | This Agreement and all disputes arising hereunder shall be governed by the laws of the State of Texas. Venue for all such disputes shall be proper and lie exclusively in Wilson County, Texas.

**IN WITNESS WHEREOF**, the parties hereto have caused their names to appear below, signed by authorized representatives.

<b>Floresville Electric Light &amp; Power System</b>	
By (Signature):	_____
Name (Print):	_____
Title:	_____
Date:	_____
<b>Customer</b>	
By (Signature):	_____
Name (Print):	_____
Date:	_____

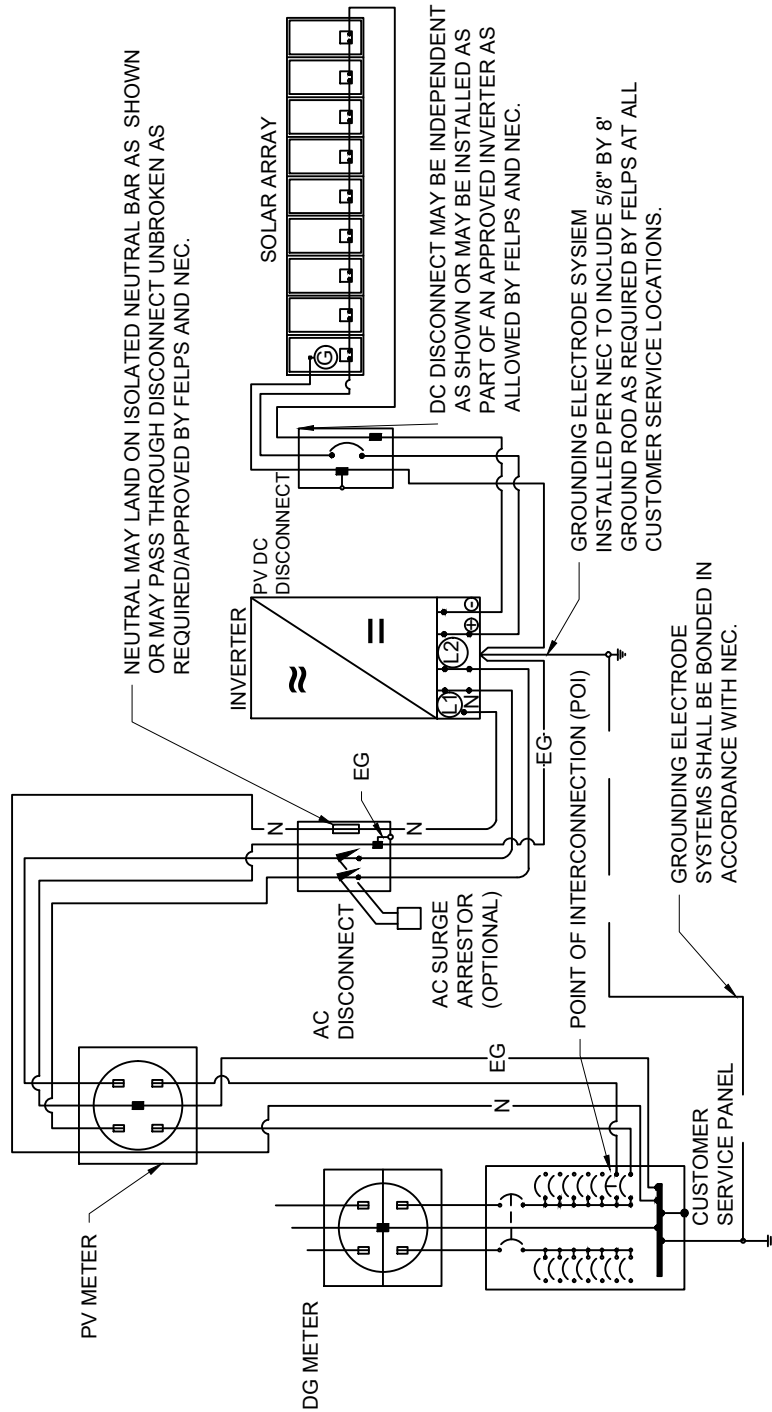
# FELPS

*Distributed Generation  
Guidelines Manual*

***DG Interconnection Diagrams***

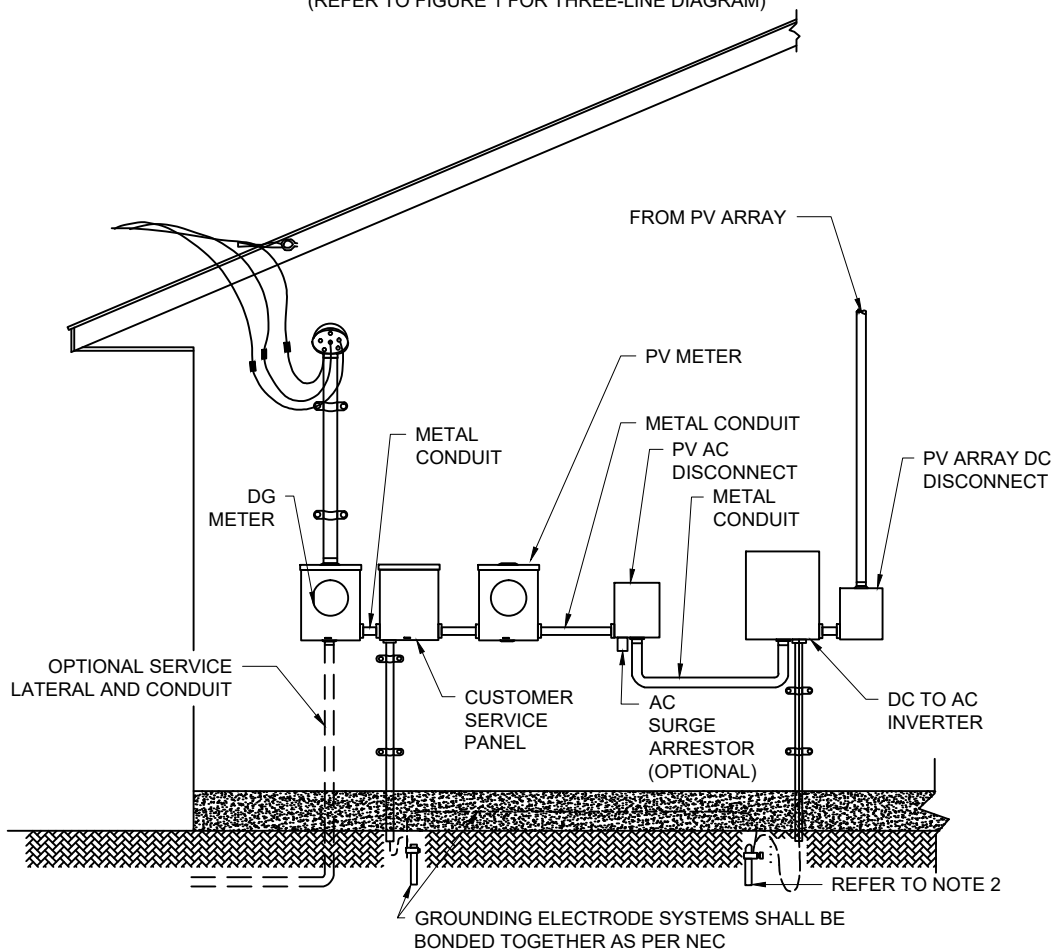


FIGURE 1  
 TYPICAL PHOTOVOLTAIC (PV) SYSTEM  
 120/240-VOLT SINGLE-PHASE THREE-WIRE DIAGRAM



- NOTES:
1. TYPICAL INTERACTIVE PV SYSTEM WIRING DIAGRAM, FOR ILLUSTRATION PURPOSES ONLY. REFER TO EQUIPMENT MANUFACTURER LITERATURE FOR ACTUAL EQUIPMENT WIRING RECOMMENDATIONS. INSTALLATION SHALL COMPLY WITH FELPS ELECTRIC SERVICE STANDARDS AND NATIONAL (NEC, UL AND IEEE) CODES.
  2. INVERTER OUTPUT CIRCUIT CONDUCTORS SHALL BE INSTALLED IN METAL RACEWAYS.
  3. THE PV DC GROUNDING SYSTEM SHALL NOT BE BONDED TO THE AC GROUNDING SYSTEM BY USING A COMBINED DC GROUNDING ELECTRODE CONDUCTOR AND AC EQUIPMENT GROUNDING CONDUCTOR. CONTRACTOR MAY CHOOSE TO USE THE OPTION SHOWN ABOVE OR MAY INSTALL A GROUNDING ELECTRODE CONDUCTOR FROM THE INVERTER DIRECTLY TO THE SERVICE GROUNDING ELECTRODE SYSTEM.

FIGURE 2  
 TYPICAL 120/240-VOLT, SINGLE-PHASE PHOTOVOLTAIC (PV) SYSTEM  
 (REFER TO FIGURE 1 FOR THREE-LINE DIAGRAM)



**NOTES:**

1. INVERTER OUTPUT CIRCUIT CONDUCTOR SHALL BE INSTALLED IN METAL RACEWAYS FROM INVERTER TO POINT OF INTERCONNECTION.
2. GROUNDING ELECTRODE SYSTEM INSTALLED AS PER NEC TO INCLUDE 5/8-INCH X 8-FOOT GROUND ROD AS REQUIRED BY FELPS AT ALL CUSTOMER SERVICE LOCATIONS.
3. THE PV DC GROUNDING SYSTEM SHALL NOT BE BONDED TO THE AC GROUNDING SYSTEM BY USING A COMBINED DC GROUNDING ELECTRODE CONDUCTOR AND AC EQUIPMENT GROUNDING CONDUCTOR. CONTRACTOR MAY CHOOSE TO USE THE OPTION SHOWN ABOVE OR MAY INSTALL A GROUNDING ELECTRODE CONDUCTOR DIRECTLY FROM THE INVERTER GROUNDING ELECTRODE TERMINAL TO THE MAIN SERVICE GROUNDING ELECTRODE SYSTEM.
4. THE PV AC DISCONNECT SHALL BE LOCATED IMMEDIATELY ADJACENT TO THE DG METER.
5. LABELING AND IDENTIFICATION OF ALL PV RELATED EQUIPMENT SHALL BE DONE IN ACCORDANCE WITH THE NEC.



ELECTRICAL DISTRIBUTION  
 CONSTRUCTION SPECIFICATIONS



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 TEXAS REGISTRATION  
 NUMBER F-1594

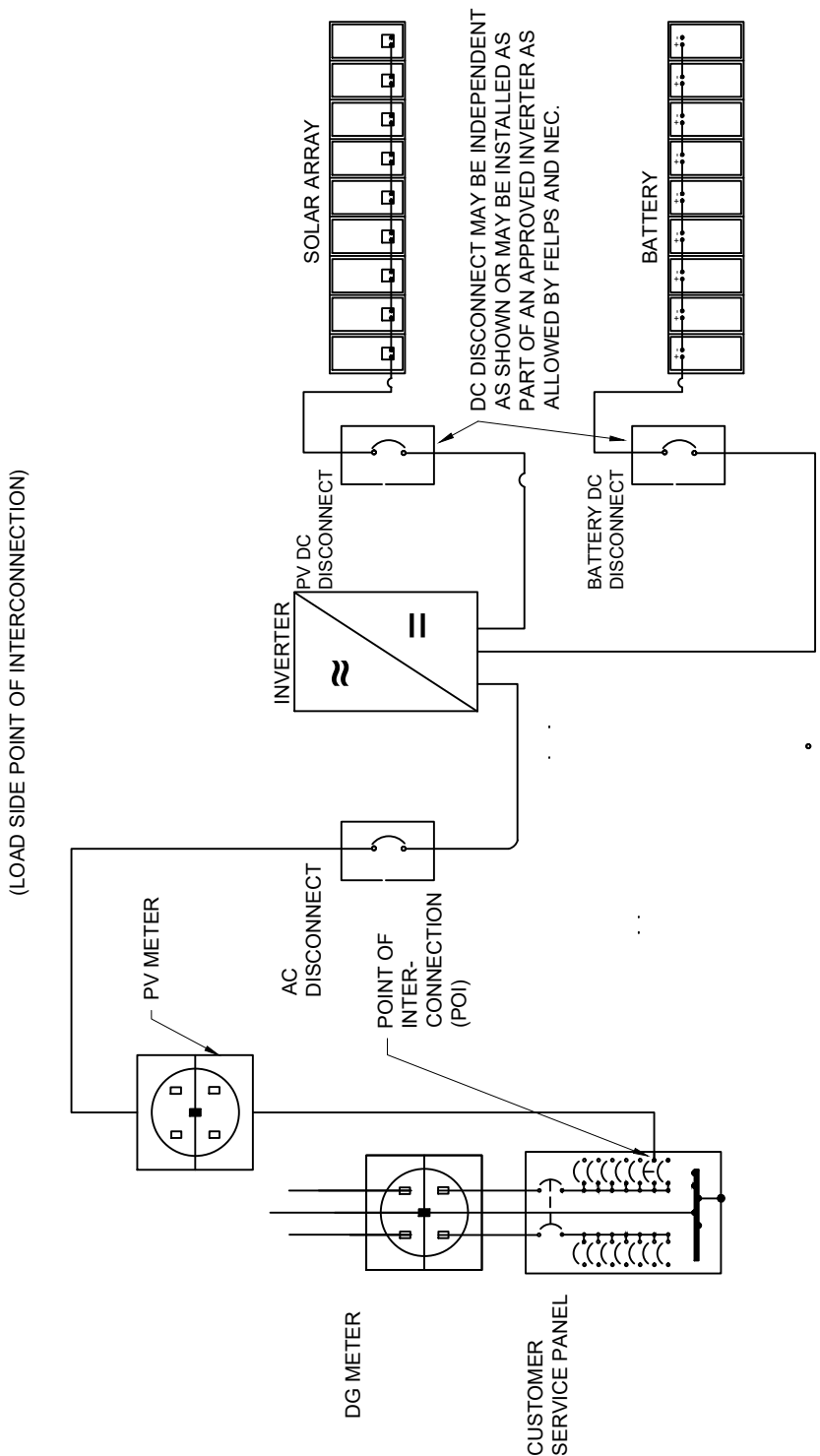
TYPICAL  
 PHOTOVOLTAIC SYSTEM

APPROVED

BY

UNIT NUMBER  
 FIGURE 2

FIGURE 3  
 TYPICAL PHOTOVOLTAIC (PV) & BATTERY BACKUP  
 SYSTEMS 120/240-VOLT SINGLE-PHASE ONE-LINE DIAGRAM



- NOTES:
1. TYPICAL INTERACTIVE PV & BATTERY SYSTEM WIRING DIAGRAM, FOR ILLUSTRATION PURPOSES ONLY. REFER TO EQUIPMENT MANUFACTURER LITERATURE FOR ACTUAL EQUIPMENT WIRING RECOMMENDATIONS. INSTALLATION SHALL COMPLY WITH FELPS ELECTRIC SERVICE STANDARDS AND NATIONAL (NEC, UL AND IEEE) CODES.
  2. INVERTER OUTPUT CIRCUIT CONDUCTORS SHALL BE INSTALLED IN METAL RACEWAYS.
  3. THE PV DC GROUNDING SYSTEM SHALL NOT BE BONDED TO THE AC GROUNDING SYSTEM BY USING A COMBINED DC GROUNDING ELECTRODE CONDUCTOR AND AC EQUIPMENT GROUNDING CONDUCTOR. CONTRACTOR MAY CHOOSE TO USE THE OPTION SHOWN ABOVE OR MAY INSTALL A GROUNDING ELECTRODE CONDUCTOR FROM THE INVERTER DIRECTLY TO THE SERVICE GROUNDING ELECTRODE SYSTEM.



ELECTRICAL DISTRIBUTION  
 CONSTRUCTION SPECIFICATIONS



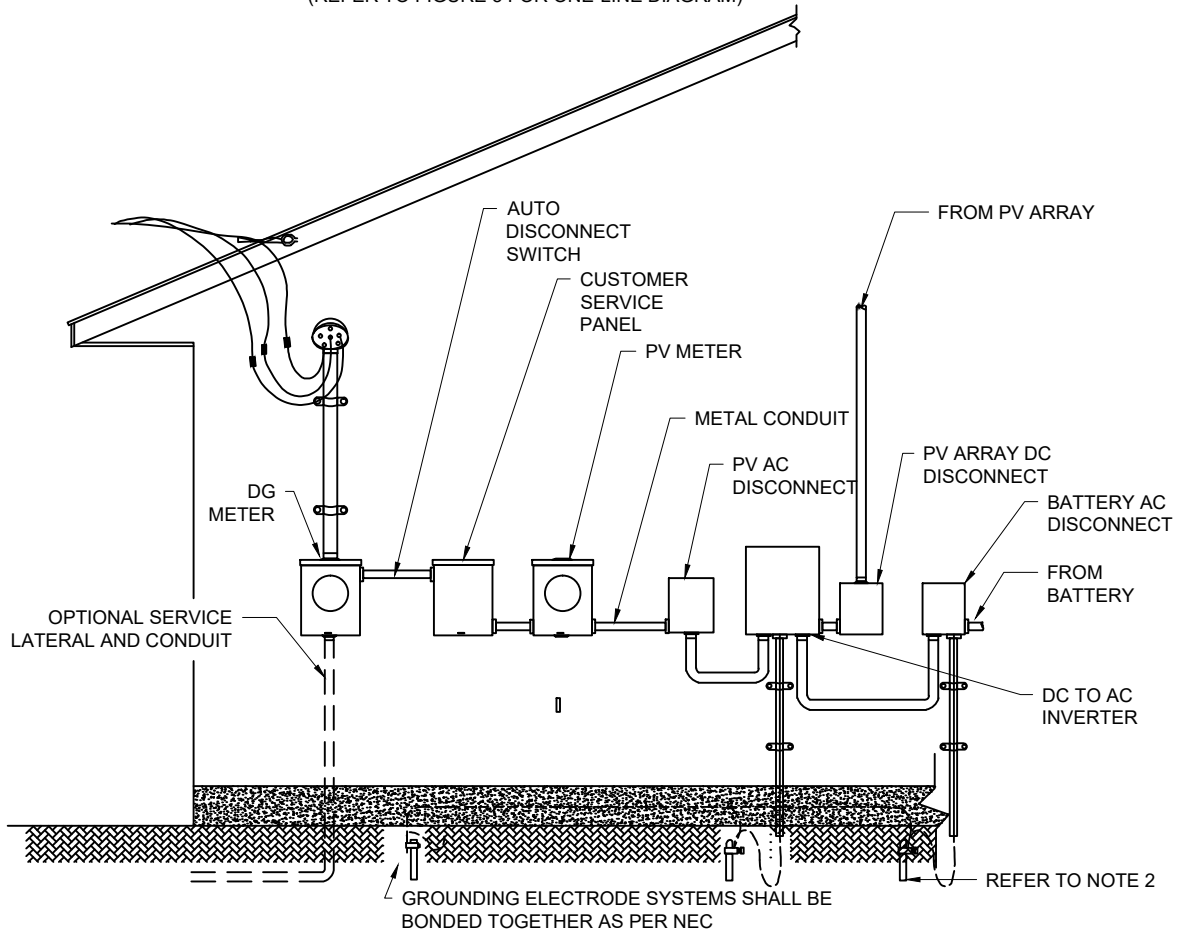
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TYPICAL  
 PV & BATTERY SYSTEM

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UNIT NUMBER  
 FIGURE 3

FIGURE 4  
 TYPICAL 120/240-VOLT, SINGLE-PHASE PV & BATTERY SYSTEMS  
 (REFER TO FIGURE 3 FOR ONE-LINE DIAGRAM)



**NOTES:**

1. INVERTER OUTPUT CIRCUIT CONDUCTOR SHALL BE INSTALLED IN METAL RACEWAYS FROM INVERTER TO POINT OF INTERCONNECTION.
2. GROUNDING ELECTRODE SYSTEM INSTALLED AS PER NEC TO INCLUDE 5/8-INCH X 8-FOOT GROUND ROD AS REQUIRED BY FELPS AT ALL CUSTOMER SERVICE LOCATIONS.
3. THE PV DC GROUNDING SYSTEM SHALL NOT BE BONDED TO THE AC GROUNDING SYSTEM BY USING A COMBINED DC GROUNDING ELECTRODE CONDUCTOR AND AC EQUIPMENT GROUNDING CONDUCTOR. CONTRACTOR MAY CHOOSE TO USE THE OPTION SHOWN ABOVE OR MAY INSTALL A GROUNDING ELECTRODE CONDUCTOR DIRECTLY FROM THE INVERTER GROUNDING ELECTRODE TERMINAL TO THE MAIN SERVICE GROUNDING ELECTRODE SYSTEM.
4. THE PV AC DISCONNECT SHALL BE LOCATED IMMEDIATELY ADJACENT TO THE DG METER.
5. LABELING AND IDENTIFICATION OF ALL PV RELATED EQUIPMENT SHALL BE DONE IN ACCORDANCE WITH THE NEC.

**FELPS**

ELECTRICAL DISTRIBUTION  
 CONSTRUCTION SPECIFICATIONS

**SCHNEIDER  
 ENGINEERING**

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 NUMBER F-1594

TYPICAL  
 PV & BATTERY SYSTEM

APPROVED BY

UNIT NUMBER  
 FIGURE 4

# **FELPS**

*Distributed Generation  
Guidelines Manual  
**DG Rate Rider***

**FLORESVILLE ELECTRIC LIGHT AND POWER SYSTEM  
FLORESVILLE, TEXAS**

**APPENDIX B  
DISTRIBUTED GENERATION<sup>1</sup> RIDER**

**APPLICABILITY**

This Rider is available to any retail Customer, excluding Outdoor Recreational Lighting, Security Lighting, and City Lighting Customers receiving electric service under a Floresville Electric Light and Power System electric rate tariff that owns and operates an on-site generating system capable of producing ten megawatts (10 MW) or less and interconnects with the Floresville Electric Light and Power System's electric distribution system.

**APPLICATION AND AGREEMENT**

Customers requesting interconnection and parallel operation of Distributed Generation shall complete the Application for Interconnection and Parallel Operation of Distributed Generation (Application) with Floresville Electric Light and Power System. Following completion of the Application, Floresville Electric Light and Power System shall review the Application, make any additional requests for additional information, or request revision to the original application.

Upon determination by Floresville Electric Light and Power System that the Customer's facility is consistent with the safe and reliable operation of the Floresville Electric Light and Power System's distribution system, the Utility and Customer shall enter into an Agreement for Interconnection and Parallel Operation of Distributed Generation (Interconnection Agreement), which sets forth the contractual conditions under which the Utility and Customer agree that one or more facilities may be interconnected with the Floresville Electric Light and Power System's distribution system.

**CONDITIONS OF SERVICE:**

1. All charges, character of service, and terms and conditions of the Floresville Electric Light and Power System Electric Rate Schedule under which the Customer receives service apply except as expressly altered by this Rider.
2. The Customer shall comply with the technical requirements in the Floresville Electric Light and Power System's Distributed Generation Policy and procedures set forth in The Public Utility Commission of Texas Substantive Rule 25.212 for safe and effective connection and operation of Distributed Generation, which describes typical interconnection

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<sup>1</sup> Distributed Generation is defined, for the purposes of this Rider, as an electrical generating facility located at Customer's point of delivery that is 10 MW or less and connected to the Floresville Electric Light and Power System distribution system at a standard available voltage less than or equal to 60 kilovolts and 60 Hertz alternating current.

requirements. Floresville Electric Light and Power System may require Customer to install and use more sophisticated protective devices and operating schemes when the Distributed Generation facility is exporting power to the Floresville Electric Light and Power System distribution system or when otherwise required due to specific interconnection location and condition.

3. The Customer shall obtain approval from Floresville Electric Light and Power System *before* the Customer energizes the Customer's on-site generating system or interconnects it with the Floresville Electric Light and Power System's electric system. The term of an agreement under this Rider is one year and month to month thereafter.
4. The Customer is responsible for all costs of interconnecting with the Floresville Electric Light and Power System electric system, including transformers, service lines, or other equipment as deemed necessary by Floresville Electric Light and Power System for safe installation and operation of the Customer's equipment with the Utility's distribution system. The Customer is responsible for any costs associated with required inspections and permits.
5. Floresville Electric Light and Power System may perform interconnection studies, which shall include service study, coordination study, and utility system impact study, as needed and determined in the sole discretion of Floresville Electric Light and Power System. In instances where such studies are deemed necessary, the scope of such studies shall be based on the characteristics of the particular distributed generation facility to be interconnected and the Floresville Electric Light and Power System's distribution system at the specific proposed location. Floresville Electric Light and Power System will charge Customer fees for Pre-Interconnection Studies that recover the costs of performing such studies. Any modifications or additions to Floresville Electric Light and Power System Electric System identified through the interconnection study as required for the safe and reliable interconnection of Customer's facility shall be solely at the Customer's expense. Customer shall not acquire any ownership in such modifications or additions to the Floresville Electric Light and Power System Electric System.
6. All other terms and conditions will be negotiated between Floresville Electric Light and Power System and the Customer in the Agreement for Interconnection and Parallel Operation of Distributed Generation.
7. These Conditions of Service are not exhaustive and may be supplemented by internal guidelines and policies to Floresville Electric Light and Power System staff, as well as good utility and engineering practices. Internal policies and guidelines will be made available upon request. All denials made or changes requested throughout the interconnection process will be accompanied with a written explanation by Floresville Electric Light and Power System staff regarding the decision.

**METERING:**

1. The actual metering equipment required, its voltage rating, number of phases and wires, size, current transformers, number of input and associated memory is dependent upon the type, size, and location of the electric service provided. The Customer shall pay for the installation of the data recorder (meter) that is capable of measuring the Delivered KWh (energy delivered by Floresville Electric Light and Power System) and the Received KWh (energy delivered to the Floresville Electric Light and Power System by the Customer) using a single meter or two-meter configuration. Additionally, for all Customers, Floresville Electric Light and Power System reserves the right to install, at its own expense, a meter to measure the output of the Distributed Generation system.

**RATE:**

1. In a billing month after a Customer receives approval to interconnect the Customer's on-site generating system from Floresville Electric Light and Power System, the Utility will determine the Delivered KWh and the Received KWh on an ongoing, monthly basis.
2. The Delivered KWh (energy) will be billed on the standard applicable rate schedule.
3. The Received KWh (energy) will be multiplied by the Floresville Electric Light and Power System Avoided Cost of Generation for the applicable billing cycle to determine the amount the Utility shall credit the Customer.
4. The Avoided Cost of Generation is based on the actual cost of power supply from the Floresville Electric Light and Power System wholesale supplier(s). Floresville Electric Light and Power System shall credit the Customer's account for this amount.
5. Any credit related to the Avoided Cost of Generation shall be remitted by Floresville Electric Light and Power System to the Customer in a reasonable time period.
6. All Customers with Distributed Generation will be subject to an increase in the Monthly Service Charge by the following amounts:

<b>Nameplate Capacity (kW)</b>	<b>Monthly Service Charge Adder</b>
Less than 5 kW	\$4.80
5 kW and less than 10 kW	\$9.60
10 kW and less than 15 kW	\$14.40
15 kW and less than 20 kW	\$19.20
20 kW and less than 50 kW	\$48.00
50 kW and less than 100 kW	\$96.00
100 kW and less than 150 kW	\$144.00