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XIII. DISTRIBUTED GENERATION

A. Net metering

Net metering allows FPL customers to offset all or part of their energy use with on-site generation. Any excess generation will be credited to the customer's energy consumption for the next month's billing cycle. Florida Administrative Code (FAC) Section 25-6.065.

The customer shall meet all applicable technical, interconnection, safety and protection requirements of this and other FPL documents. The customer must also meet the requirements of the NESC, OSHA, and any others applicable to the installation.

The customer shall conform to FPL, National Electric Code (NEC) and Authority Having Jurisdiction (AHJ), for installation requirements. The customer's AC (AC) inverter rating will determine the Tier that the generation system falls under in the net metering policy.

- Tier 1: less than or equal to 10 KW
- Tier 2: greater than 10KW and less than or equal to 100KW
- Tier 3: greater than 100KW and less than or equal to 2MW

It is highly recommended that customers obtain FPL's written interconnection approval prior to procuring any material.

For any inquiries regarding Net Metering please reach out to netmetering@fpl.com.

1. **Inverter** – The customer must utilize a certified UL 1741 SA and IEEE 1547 grid interactive inverter. Inverters that have not been certified to UL Standard will be denied interconnection. FPL may require advanced inverter settings or other controls to minimize impact to FPL customers and the grid.
2. **Transformer** – Generating facilities greater than 50 KW AC will require a three phase 120/208V or 277/480 Wye grounded transformer. FPL will specify any winding connections, grounding or other requirements based on the specific customer site location and generating system. Open delta transformers will only be connected as a single phase and only supply power to the lighting transformer.
3. **Metering** – Metering will be specified by FPL and may be self-contained or primary depending on the size and configuration of the customer's generating system. Meter numbers associated with interconnecting premise must be included in Single Line Diagrams (SLD) and/or plans.
4. **Disconnect Switch** – All tier 2 and tier 3 systems require an FPL approved visually open Distributed Energy Resource (DER) disconnect switch to allow safe restoration of FPL's system. The DER disconnect switch must be installed on the AC side of the system. The manual disconnect switch must be mounted separate from but adjacent to the FPL meter socket within 10 feet and must always remain accessible to FPL. Plans must show dimensions between the location of the meter socket and the DER disconnect switch. There shall be no locked gates, doors or fences between the meter socket and the DER disconnect switch. The DER disconnect switch shall be connected on the load side of the meter to the approved IEEE 1547 inverter and the line side of the DER disconnect switch shall be connected to FPL's power grid. This device will vary depending on the configuration, voltage, and generation capacity.
5. **Interconnection** – Customer generation is limited to 90 percent of the FPL distribution service rating (Transformer). FPL recommends that all interconnections will be performed on the load side of the customer's main electrical panel. If the interconnection is performed on the line side



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of the customers main electrical panel (per NEC) a manual AC disconnect is required between AC generation output and the point of interconnection to FPL facilities. The manual disconnect switch must be mounted separate from but adjacent to the FPL meter socket within 10 feet and must always remain accessible to FPL. Under no circumstance will the customer make interconnections in any FPL equipment including metering enclosures, transformers, switching cabinets, vaults, or any other devices not specifically designated by FPL as the point of interconnection. For all installations customers shall provide appropriately sized and number of conductors, including a neutral. No fault current limiting devices may be installed on the neutral or conductors.

The customer is responsible for all costs associated with any equipment or facilities that require upgrading or modification. The customer's generating equipment shall not cause any negative impacts to other FPL customers or the grid. FPL may disconnect any customer generation for any valid reason.

All net metering systems require written approval and agreement from FPL.

6. **Labeling** – All labels must be permanent and weatherproof/UV resistant placard with engraved letters. The customer is responsible for all labeling requirements. The following labels must be installed at the interconnecting meter can and the DER disconnect switch.

INTERCONNECTING METER CAN

WARNING
MULTI POWER SOURCES
ENTER SOURCES HERE
RATED AC OUTPUT CURRENT ** AMPS
NOMINAL OPERATING VOLTAGE ** VOLTS

DER DISCONNECT SWITCH

GENERATION SYSTEM AC DISCONNECT
RATED AC OUTPUT CURRENT ** AMPS
NOMINAL OPERATING VOLTAGE ** VOLTS



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7. **System Impact Study** – A System Impact Study may be required for some generating systems. This study will determine the requirements to interconnect the customer's generation to FPL's grid. The customer must provide detailed information on the proposed protective relaying, metering, and control equipment. All relaying and metering shall be provided in a one-line diagram. A three-line diagram may be required for some installations. The study may include but is not limited to: Protection and Coordination Study, Grounding Study, Load Flow Analysis and Arc Flash Analysis.
8. **Protection and Control** – Depending on the interconnection, customers may be required to install protective devices to safeguard the generating system and the FPL grid. Customers are responsible for protecting their system from faults, disturbances or interruptions on both the FPL and customer side. The complexity of the protective system will vary depending on the size, type, and location of the customer generation installation. All protective devices and schemes must be approved by FPL.



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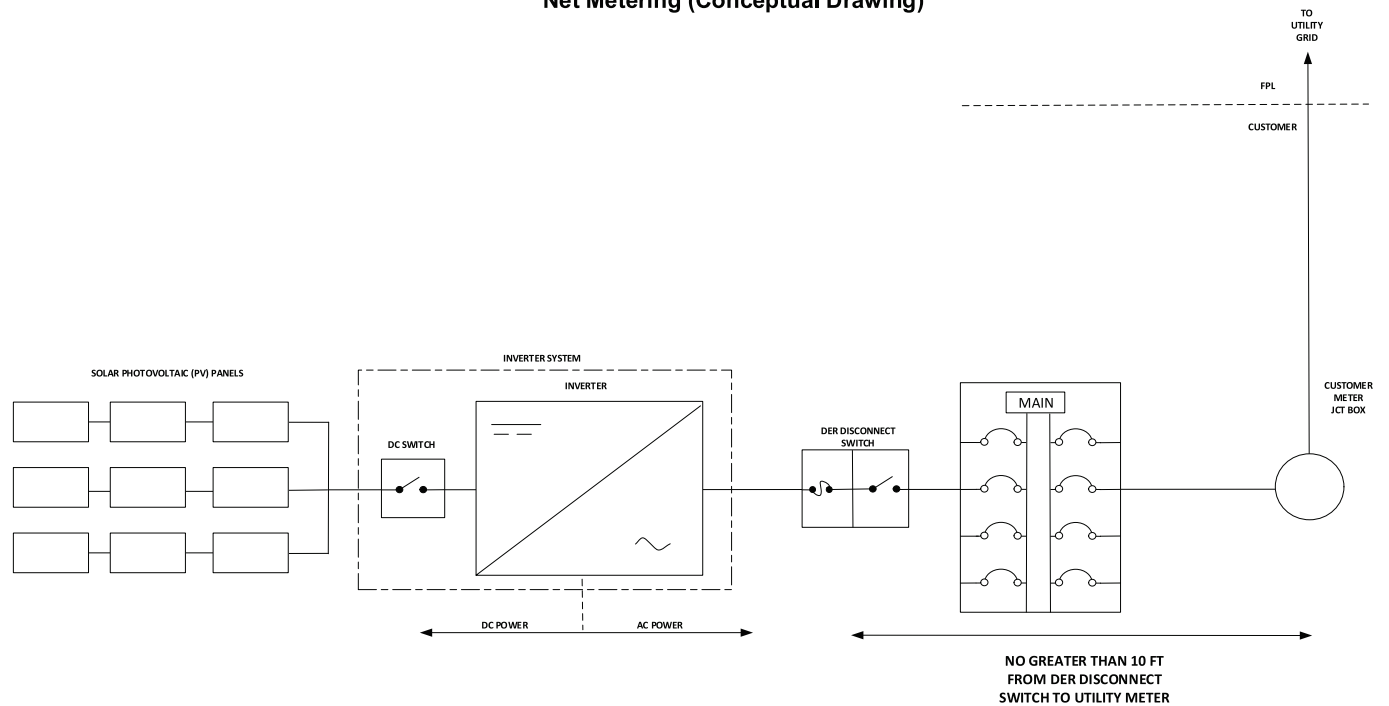
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Figure IV-1
Net Metering (Conceptual Drawing)





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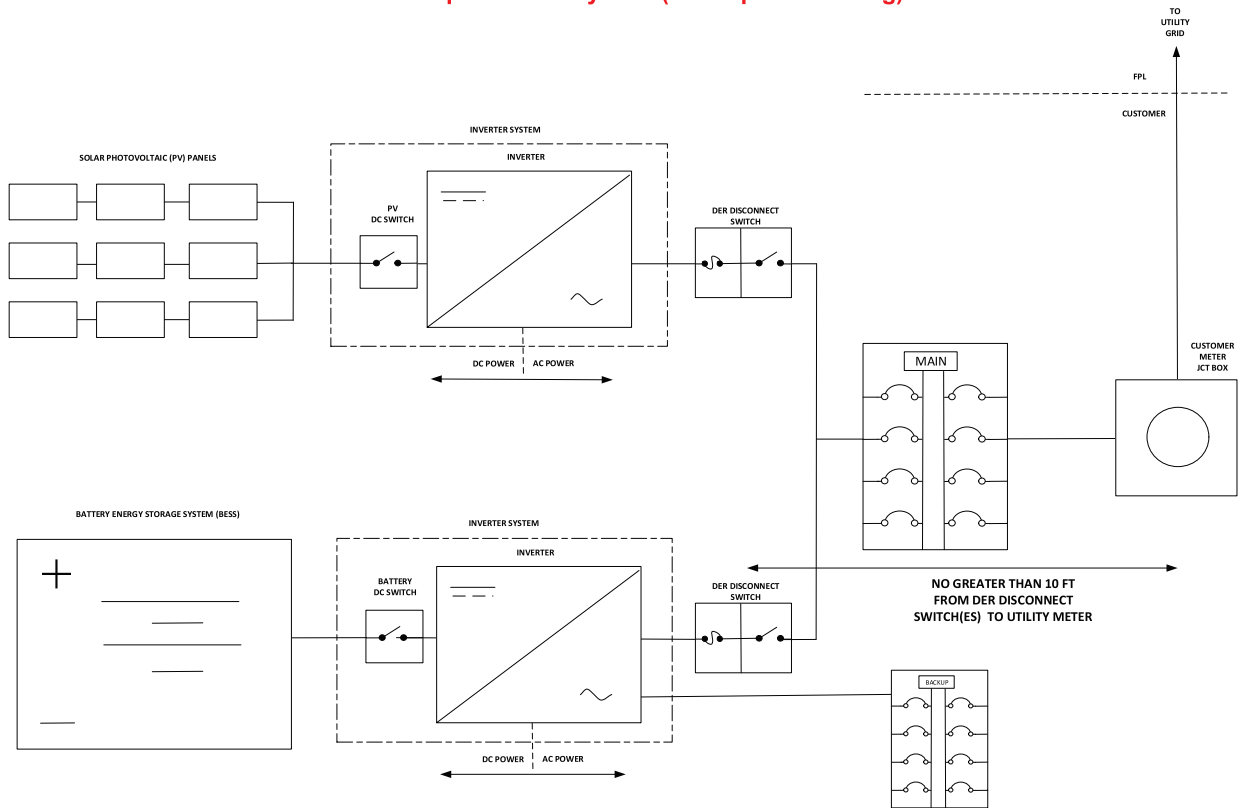
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Figure IV-2
AC Coupled BESS System (Conceptual Drawing)





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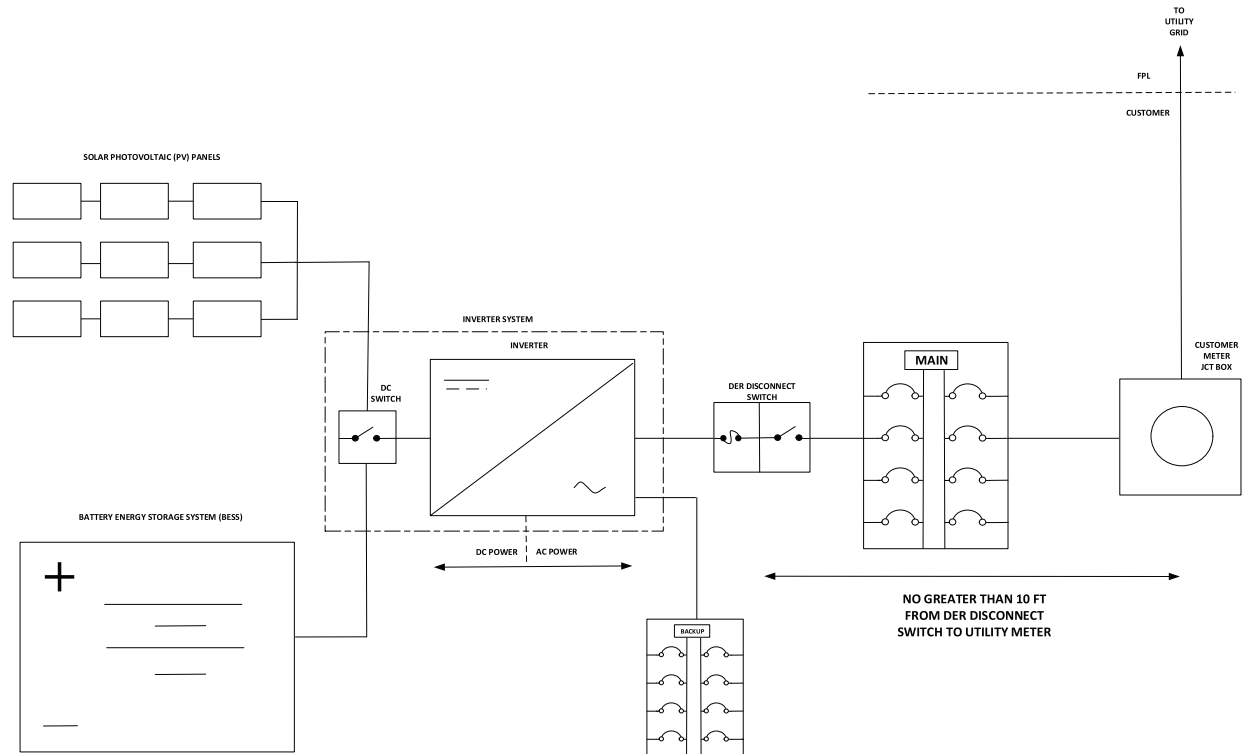
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Figure IV-3
DC Coupled BESS System (Conceptual Drawing)





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DER Disconnect Switch Utility Requirements

FPL requires a Distributed Energy Resource (DER) Disconnect Switch (on the AC side of the inverter) for all DER installations ranging from 10kW to 2MW. This switch shall be in accordance with the requirements of section XIII. "Distributed Generation" of the FPL Electric Service Standards. (ESS).

The following list of requirements is based on section XIII and is provided as a service to FPL customers.

Requirements:

- ☐ The switch shall be a "visible open" switch (blades, jaws and an air gap between them are visible to an operator).
- ☐ The "visible open" components cannot be obscured by any dead-front, arc-shield or other component (parts shall not be removed to create an unobscured view).
- ☐ The switch shall be lockable in the open position.
- ☐ FPL padlock shank (3/8") must fit on the cover hasp of the switch.
- ☐ The switch shall not be modified to accommodate an FPL lock.
- ☐ The switch shall be installed separate from, but adjacent to, the FPL meter socket within 10 feet of the meter socket and must always remain unrestricted and accessible to FPL personnel. Plans must show dimensions between the location of the meter socket and the DER disconnect switch. There shall be no locked gates, doors or fences between the meter socket and the DER disconnect switch.
- ☐ The switch enclosure shall be properly grounded.
- ☐ The switch may not be used as a raceway for any conductors other than the phased conductors being switched and the associated grounded conductor (neutral) and grounding conductor (equipment ground).
- ☐ Switch shall be rated for the voltage and current requirements of the generating facility and must be listed and conform to all applicable UL, ANSI and IEEE standards, and installed in accordance with the requirements of the NEC.
- ☐ The switch shall be connected so that the blades are de-energized when the switch is in the open position in accordance with NEC 404.6(C).

Notes:

FPL reserves the right to lock open the DER utility disconnect switch without prior notice to the customer when interconnected operation of the customer's generating facility with the FPL system could have adverse impacts on FPL's system, life or property, or upon termination of the Interconnect Agreement.



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B. Small Generation Interconnection Agreement (SGIA)

Customer generating equipment shall adhere to FERC's Small Generator Interconnection Agreement (SGIA), and Small Generation Interconnection Procedures (SGIP).

The customer shall meet all applicable technical, interconnection, safety and protection requirements of this and other FPL documents. The customer must also meet relevant requirements of the NESC, OSHA, and any others applicable to the installation.

The customer shall conform to FPL, National Electric Code (NEC) and Authority Having Jurisdiction (AHJ), for installation requirements.

The customer inverter rating (AC) will determine the Tier that the generation system falls under FERC's policy.

- Small Generation Interconnection Agreement (SGIA): Less than 20 MW
- Large Generation Interconnection Agreement (LGIA): Greater than or equal to 20 MW

It is highly recommended that customers obtain FPL's written interconnection approval prior to procuring any material.

1. **Generating Facility** – All customer-supplied Distributed Energy Resources (DERs) intended for grid interconnection must utilize equipment that is certified to comply with the latest version of IEEE 1547 and UL 1741 (SB Preferred), or other applicable standards as recognized by the utility. Certification must be performed by a Nationally Recognized Testing Laboratory (NRTL). Equipment that does not meet these certification requirements will not be approved for interconnection. The utility reserves the right to specify or adjust advanced control settings or operating parameters to ensure system reliability, power quality, and safety for all customers and the electric grid. Where multiple generating units are used, the system must be configured to present a single point of voltage source at the Point of Interconnection (POI). All generating equipment must operate at 60 Hz AC and be compatible with standard utility service voltages.
2. **Transformer** – FPL will specify any winding, grounding or other requirements based on the specific customer site location and generating system.
3. **Metering** – Metering will be specified by FPL and may be self-contained, current transformer or primary depending on the size and configuration of the customer's generating system. Meter numbers associated with interconnecting premise must be included in Single Line Diagrams (SLD) and/or plans.
4. **Disconnect Switch** – An FPL approved visually open disconnect is required to allow safe restoration of FPL's system. The disconnect switch must be installed according to FPL instruction and must remain accessible to FPL at all times. The disconnect switch shall be connected on the load side of the meter to the approved IEEE 1547 inverter and the line side of the disconnect switch shall be connected to FPL's power grid. This device will vary depending on the configuration, voltage and generation capacity.
5. **Interconnection** – FPL will determine the point of interconnection (POI). For all installations customers shall provide an appropriate number of conductors including a neutral. No fault current limiting devices shall be installed on the neutral or conductors. Under no circumstance will the customer make interconnections in any of FPL equipment including metering enclosures, transformers, switching cabinets, vaults, or any other devices not specifically designated by FPL as the point of interconnection.



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The customer will be responsible for all costs associated with any equipment or facilities that required upgrading or modification. The customer's generating equipment shall not cause any negative impact on the quality of service provided to other FPL customers or the grid. FPL reserves the right to disconnect any customer generation for any valid reason.

6. **Labeling** – All labels should be permanent and weatherproof / UV resistant placard with engraved letters. The customer is responsible for all labeling requirements. The following labels must be installed at the interconnecting meter can and the DER disconnect switch.

INTERCONNECTING METER CAN

WARNING
MULTI POWER SOURCES
ENTER SOURCES HERE
RATED AC OUTPUT CURRENT ** AMPS
NOMINAL OPERATING VOLTAGE ** VOLTS

DER DISCONNECT SWITCH

GENERATION SYSTEM AC DISCONNECT
RATED AC OUTPUT CURRENT ** AMPS
NOMINAL OPERATING VOLTAGE ** VOLTS

7. **System Impact Study** – A System Impact Study may be required for some generating systems. This study will determine the requirements to interconnect the customer's generation to FPL's grid. The customer must provide detailed information on the proposed protective relaying and control equipment. All relaying, protection and metering shall be provided in a one-line diagram. In some case's a three-line diagram may be required. The study may include, but is not limited to: Protection and Coordination Study, Grounding Study, Load Flow Analysis and Arc Flash Analysis.
8. **Protection and Control** – Depending on the interconnection, FPL may require the customer to install protective devices. These devices are to protect the grid, other customers and the FPL system. Customers are responsible for protecting their own system from faults, disturbances or interruptions originating from both FPL and the customer side. Protective devices must be approved by FPL. The complexity of the protective devices required will vary with the size, complexity, and location of the customer generation installation.



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C. Battery Storage

Battery systems for personal use (customer-owned installations behind the customer's meter)

For customers interested in installing battery storage systems for personal use (i.e., behind the customer's meter), FPL has developed the policy below. The policy ensures we adequately protect the safety of those working on the electrical grid, monitor the impact of energy storage systems on the grid, and evaluate the potential economic impact of the installation of these systems to all customers. This policy is subject to change as the implications of this emerging technology are better understood, and as legislative or regulatory action may dictate

1. **Technical Specifications** - Battery storage equipment installed behind a customer's meter must have a certification conducted by a Nationally Recognized Testing Laboratory (NRTL) to the current UL 1741 standard for safety. A placard must be permanently affixed to the meter enclosure stating "Battery storage utilized in this facility." Battery storage that is not UL 1741 certified must be DC coupled behind a UL 1741 listed device.
2. **Battery storage integrated with customer-owned renewable generation systems** - Energy stored by the battery is only for the customer's use. While it may operate interconnected with the electrical grid, at this time the customer may not export power from the battery to the grid. Battery storage for Tier 3 systems will be reviewed in the fast-track study.
3. **Battery for backup support** - Battery storage systems installed without a renewable generation system and intended as an emergency backup power source may be charged from the electrical grid. No interconnection agreement is required. However, as with customer-owned backup generators, the customer is responsible for ensuring that power from the battery does not back-feed to the grid to avoid a safety hazard for workers or the public. Customers assume all liability associated with the use of such battery systems.
4. **Battery storage continuously interconnected to the electric utility**
Customers are required to notify FPL of battery systems installed without a renewable generation system and designed to charge from the grid and operate interconnected with the grid. It is anticipated that FPL will develop a standard Utility Interactive Battery Storage application to gather information about such installations. In the interim, the customer will be required to submit a Small Generator Interconnection Application. FPL will review the application and perform a study if required by the Small Generator Interconnection Procedures. If a customer does not intend to export power to the electrical grid and FPL does not require the installation of any equipment on its system, an interconnection agreement is not required. If a customer wants to export power to the grid or FPL requires the installation of any equipment on its system, the customer will be required to complete a Small Generator Interconnection Agreement. Stand-alone battery storage systems are not included in the definition of "renewable energy" pursuant to Rule 25-6.065(2)(d), Florida Administrative Code, and the output from such systems is not net metered.

D. Electric Vehicle to X (V2X)

V2X enables customers to use their Electric Vehicle (EV) to supply power to households and the FPL grid.



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All Electrical Vehicle Supply Equipment (EVSE) shall be interconnected behind customer's main electrical panel.

1. **Vehicle to Home (V2H)** – V2H allows customers to use their Electric Vehicle to supply power to their home, but NOT export to grid. For customers interested in using vehicle to home (V2H) capabilities, for personal use, the customer must interconnect their Electrical Vehicle Supply Equipment behind the customer's main electrical panel. V2H does not require an interconnection agreement and shall be treated as a customer-owned backup generator. The customer is responsible for ensuring that power from V2H does not back-feed or export to the grid to avoid a safety hazard for workers or the public. Customers assume all liability associated with the use of such battery systems.

- a. **Isolation** – internal EVSE or mechanical disconnect between islanding and the grid – ATS or mechanical disconnect required

2. **Vehicle to Grid (V2G)** – V2G allows customers to use their Electric Vehicle to supply power to their home and export to the grid. The customer shall meet all applicable technical, interconnection, safety and protection requirements of this and other FPL documents. The customer must also meet relevant requirements of the NESC, OSHA, and any other requirements applicable to the installation.

The customer shall conform to FPL, National Electric Code (NEC) and Authority Having Jurisdiction (AHJ) for installation requirements.

If the customer's Electric Vehicle battery capacity rating (AC) is less than 20MW (inverter size and battery size), the generation system shall fall under the Small Generation Interconnection Agreement (SGIA).

- a. **Application** – All customers wishing to participate in V2G shall apply as Small Generation Interconnection Agreement. With no exception shall a customer with V2G be allowed to participate under FPL's net metering program.
 - b. **Electric Vehicle Supply Equipment** – If a customer is exporting to the grid using a V2G-DC system (EVSE + EV) and the EVSE is factory programmed for Bi-directional operation, the EVSE shall be certified by the Underwriters Laboratory (UL) 1741 SA and SB (IEEE1547-2018). If a customer is exporting to the grid using V2G-AC system (EVSE + EV) and the EVSE is factory programmed for Bi-directional operation, the EVSE shall be certified by UL1741SC and SAE J3072. All EVs must comply to UL 9741 standards.
 - c. **Communications** – Customer shall have a gateway communication module that will force the system to throw over between isolation and grid export.
 - d. **Interconnection** – Customer shall interconnect their V2G system behind customer main panel, the customer shall not interconnect in FPL equipment or on a line side tap.
 - e. **Metering** – Metering will be specified by FPL and may be self-contained, current transformer or primary depending on the size and configuration of the customer's V2G system.
 - f. **Disconnect Switch** – An FPL approved visually open disconnect is required to allow safe restoration of FPL's system. The disconnect switch must be installed according to FPL instruction and must remain accessible to FPL at all times. The disconnect switch shall be connected on the load side of the meter to the approved V2G system and the line side of the disconnect switch shall be connected to FPL's power grid. This device will vary depending on the configuration, voltage and generation capacity.



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- g. **Labeling** – All labels should be permanent and weatherproof / UV resistant placard with engraved letters. The customer is responsible for all labeling requirements.
- h. **System Impact Study** - A System Impact Study may be required for some generating systems. This study will determine the requirements to interconnect the customer's generation to FPL's grid. The customer must provide detailed information on the proposed protective relaying and control equipment. All relaying, protection and metering shall be provided in a one-line diagram. In some case's a three-line diagram may be required. The study may include, but is not limited to: Protection and Coordination Study, Grounding Study, Load Flow Analysis and Arc Flash Analysis.
- i. **Protection and Control** – Depending on the interconnection, FPL may require the customer to install protective devices. These devices are to protect the grid, other customers and the FPL system. Customers are responsible for protecting their own system from faults, disturbances or interruptions originating from both FPL and the customer side. Protective devices must be approved by FPL. The complexity of the protective devices required will vary with the size, complexity, and location of the customer generation installation.

E. Grounding and Fault Current

This section outlines the grounding and fault current standards for the interconnection of distributed energy resources (DERs) at the distribution level. DERs may be inverter-based resources (Solar) or rotational machines (Generators). It is intended to guide interconnecting customers in ensuring their generating facility's grounding arrangement is compatible with FPL's effectively grounded distribution system (As defined in IEEE Std C62.92.4).

1. **Transformer Configurations** – The following transformer configurations are recommended that ensure effective system grounding and fault current control:

- Wye-grounded primary to wye-grounded secondary.
- Wye-grounded primary to delta secondary.

These configurations help manage fault current contributions, prevent overvoltages, and maintain system stability.

The following transformer configurations are **not recommended** due to their potential to compromise effective system grounding and fault current control:

- Delta-ungrounded primary to wye secondary.
- Delta-ungrounded primary to delta secondary.
- Wye-ungrounded primary to wye or delta secondary.
- Open-Delta or Wye configurations

The use of transformers with delta windings facing the distribution feeder/circuit should be avoided.

Use of grounding transformers (e.g., wye-grounded delta or zig-zag) for ungrounded sources may be needed (Please see Point 3 for additional details).



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- 2. Grounding Transformer Requirements** – Grounding transformers may be required for DERs that do not provide a direct ground reference. Requirements include:

- Consideration of installation of grounding transformers for ungrounded inverter-based systems or unpreferred interconnecting, dedicated, or isolation transformers may trigger the need for a comprehensive grounding study.
- Proper sizing and placement to ensure effective fault current paths and voltage control must be submitted to FPL for review.

- 3. Fault Current Mitigation Strategies** – The interconnecting customer must supply FPL the 3 Phase and Phase-to-Ground fault current capability of their Generating Facility for a fault at their Point of Interconnection (POI), independent of FPL system, that is, assuming that the FPL feeder service is disconnected (Open Switch).

To mitigate fault currents and protect equipment, FPL may require the following:

- Use of phase and/or neutral reactors to limit fault current.
- Relay coordination and grading to detect and isolate faults effectively.
- Use of Transfer Trip where applicable. Transfer Trip is a tele-protection mechanism that sends a signal from a substation to another downstream device to initiate a breaker trip
- Ground potential rise (GPR) analysis and mitigation for safety compliance.

To mitigate fault currents and protect equipment, FPL shall require the following:

- DER systems over 100kW shall present as an effectively grounded source so that the ground reference is maintained even when the FPL source is disconnected.

4. Standards and References

The following standards and guidelines should be referenced in grounding and fault current practices:

- IEEE Std C62.92.4-2014: Neutral grounding for distribution systems (2.4 kV to 34.5 kV).
- IEEE Std C62.92.6-2017: Grounding of inverter-based systems.
- IEEE Std. 1547-2018 Interconnection and Interoperability Requirements for DERs
- National Electrical Safety Code (NESC): Defines effective grounding and safety rules.