

## Appendix A Interconnection Requirements For All Renewable Generation Systems Up to 2 MW

### A. Definitions

1. “Customer-owned renewable generation system” (RGS) means an electric generating system located on a customer’s premise that is primarily intended to offset part or all of the customer’s electricity requirements with renewable energy. The term “customer-owned renewable generation” does not preclude the customer of record from contracting for the purchase, lease, operation, or maintenance of an on-site renewable generation system with a third-party under terms and conditions that do not include the retail purchase of electricity from the third-party.
  - a. Tier 1 is a system with a rating of 10 kW or less.
  - b. Tier 2 is a system with a rating of greater than 10 kW and less than or equal to 100 kW.
  - c. Tier 3 is a system with a rating of greater than 100 kW and less than or equal to 2 MW.
2. “Renewable energy”, as defined in Section 377.803, Florida Statutes, means electrical, mechanical, or thermal energy produced from a method that uses one or more of the following fuels or energy sources: hydrogen, biomass, solar energy, geothermal energy, wind energy, ocean energy, waste heat, or hydroelectric power.
3. Photovoltaic (PV) system is a solar electric generator. The array rating is under standard operating conditions (SOC) of 1000 watts/m<sup>2</sup> solar irradiance, nominal operating cell temperature, air mass 1.5, and ASTM standard solar spectrum.
4. Inverter, also referred to as a power conditioner, is a DC to AC device that converts PV energy to AC energy for utility interconnection. The inverter contains many control functions, such as voltage and frequency monitoring and protection against islanding.
5. “Gross Power Rating” (GPR) means the total manufacturer’s AC nameplate generating capacity of an on-site customer-owned renewable generating system that will be interconnected to and operate in parallel with the utility’s distribution facilities. For inverter-based systems, the AC nameplate generating capacity shall be calculated by multiplying the total installed DC nameplate generating capacity by .85 in order to account for losses during the conversion from DC to AC.

### B. Standards and Codes

1. Inverters, PV Modules and Panels
  - a. Inverter(s) must be listed and in compliance with Underwriters Laboratories (UL) Subject 1741, Standard for Static Inverters and Charge Controllers for Use in Photovoltaic Systems. Utility-interactive inverters that pass the tests of the UL 1741 standard will be, by definition, “non-islanding” inverters and will comply with the IEEE 1547-2003 interconnection standard.
  - b. Multiple inverter units. For multiple inverter units, verification that the photovoltaic system ceases to energize within 0.16 seconds (per IEEE 1547-2003), upon loss of sensed voltage, is required. This is verified with on-site testing.

- c. PV modules must be listed and be in compliance with Underwriters Laboratories (UL) Standard 1703, Standard for Safety: Flat-Plate Photovoltaic Modules and Panels.
    - d. PV modules must be in compliance with IEEE Recommended Practice for Qualification of Photovoltaic (PV) Modules.
  2. System Installation. Customer certifies that the RGS installed shall be in compliance with the following standards:
    - a. IEEE-1547 (2003) Standard for Interconnecting Distributed Resources with Electric Power Systems
    - b. IEEE-1547.1 (2005) Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems
    - c. UL-1741 (2005) Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources
    - d. Currently adopted National Electric Code, all relevant articles (or subsequent revisions) and local building codes
  3. GPR
    - a. The GPR shall not exceed 90% of the Customer's utility distribution service rating at the Customer's location. If the GPR does exceed that 90% limit, the Customer shall be responsible to pay the cost of upgrades for that distribution service to accommodate the GPR capacity and ensure the 90% threshold is not breached.
    - b. It is the Customer's responsibility to notify OUC of any change to the GPR by submitting a new Interconnection Application and Compliance Form specifying the modifications at least 30 days prior to making the modifications.
  4. OUC Inspection and Approval.
    - a. Customer shall have the installed RGS inspected and approved by the appropriate local code authorities having jurisdiction. OUC reserves the right to require the Customer to provide proof of this inspection and approval.
    - b. Prior to operation, OUC reserves the right to inspect the RGS installation to ensure compliance with the standards and codes noted in the previous sections. If OUC chooses to exercise this option, it agrees to inspect and, if the system is in compliance, provide written approval of the interconnection (using the Interconnection Application and Compliance Form) within ten working days following the request for inspection and approval. Parallel operation of the RGS with the grid shall not begin without the approval of OUC. The customer must notify OUC of any modifications at least 30 days prior to making the modifications.
  5. Islanding. The Customer shall not energize OUC's system when it is de-energized. The Customer shall cease to energize OUC's system during a faulted condition on OUC's system. The Customer shall cease to energize OUC's system prior to the automatic or non-automatic reclosing of OUC's protective device(s). There shall be no intentional islanding, as described in IEEE 1547, between the Customer's and OUC's systems.

6. Extreme Conditions. OUC reserves the right to refuse to accept electric power from the PV system under extreme conditions as described below. If OUC chooses to exercise this option, which may involve physically disconnecting from the PV system, it agrees to notify the Customer when such conditions exist or are anticipated, and to reconnect when the adverse conditions no longer exist. Examples of conditions that may lead to disconnection include:
  - a. OUC system emergencies and/or maintenance requirements,
  - b. Hazardous conditions existing on the RGS or its protective equipment,
  - c. Adverse effects of the RGS operation on other OUC customers, or
  - d. Failure of the RGS complying with regulations, rules, orders or decisions of any government or regulatory authority having jurisdiction over the generating equipment or operation.
7. External Disconnect Switch.
  - a. For Tier 1 RGS OUC recommends, but does not require, an isolation device (manual disconnect switch). However, without an isolation device, (should there be a need to isolate the RGS) OUC will remove the meter, resulting in loss of utility distribution service.
  - b. For Tier 2 and Tier 3 RGS, OUC reserves the right to require an isolation device per IEEE 1547-2003. The isolation device shall be a lockable manual disconnect switch of the visible load break type that is both visible to and accessible by OUC personnel. The isolation device shall be located separate from, but adjacent to, the meter base.
8. Testing of Protective Relays. OUC reserves the right to review periodic test reports as required per IEEE 1547-2003.
9. Insurance.
  - a. Tier 1 RGS, OUC recommends that the Customer maintain an appropriate level of general liability insurance for personal injury and property damage.
  - b. Tier 2 RGS. The Customer shall maintain general liability insurance for personal injury and property damage for not less than one million dollars (\$1,000,000). The Customer shall provide initial proof of insurance or sufficient guarantee and proof of self-insurance. For residential customers with systems between 10 kW and 20 kW, OUC recommends that the customer maintains an appropriate level of general liability insurance for personal injury and property damage.
  - c. Tier 3 RGS. The Customer shall maintain general liability insurance for personal injury and property damage for not less than two million dollars (\$2,000,000). The Customer shall provide initial proof of insurance or sufficient guarantee and proof of self-insurance.

10. RGS Equipment Protection. It is the responsibility of the Customer to protect its generating equipment, inverters, protection devices, and other system components from damage by the normal conditions and operations that occur on the part of OUC in delivering and restoring system power. The customer is also responsible for ensuring that its RGS equipment is inspected, maintained and tested regularly in accordance with the manufacturer's instructions to ensure that it is operating correctly and safely.
11. Isolation Transformer. RGS greater than 20 kW must be interconnected to OUC's system through an isolation transformer (other than RGS owner, no other OUC customer is to be served from this transformer).
12. Transfer Trip and Reclose Blocking. For Tier 2 and Tier 3 RGS where the aggregate generation capacity exceeds 50% of the peak load on any automatic reclosing device, OUC requires transfer trip and reclose-blocking on automatic reclosing devices.
13. System Study. RGS greater than 100 kW may require a system study. Additional protective devices may be required, as specified in the OUC "Guide for Producer-Owned Generating Interconnections".