



**Appendix F**  
**Exhibit F-1**

**Guaranteed PV Plant**  
**Performance**

**for**

**2021 Request for Proposals**

**for**

**Renewable Resources**

**For Entergy Arkansas, LLC**

Entergy Arkansas, LLC

August 3, 2021

**Exhibit F-1**  
**GUARANTEED PV PLANT PERFORMANCE**

**Availability Terms:**

Acceptable Data. Meteorological data collected from calibrated site pyranometers with agreement within 5% of each other and data collected from Inverter Zone instruments with agreement within 15% (prorated for AC capacity) of each other with the exception of temperature data which is in agreement within three degrees Celsius or as mutually agreed. Data collected on the Time Interval outside this range or with 1% of full scale offset from zero will be excluded from the test dataset.

Excludable Events. Events defined where the Operating Period dataset may be adjusted by excluding or removing data for Time Intervals that meet the criteria defined in the section titled “Excludable Events” herein.

Inverter Zone. An individually measured section of the DC input connected to an inverter and AC output connected to the inverter station transformer.

Measured Availability. The percent time during an Operating Period that the Facility meets the criteria to be considered as available based on the capacity weighted sum of Inverter Zone availabilities.

Time Interval. Within an Operating Period dataset, the 10-minute time frequency utilized for guarantee calculations. Each Time Interval reading is an average of whatever raw data frequency is available for that Time Interval.

**Availability Calculation:**

The *Measured Availability* (A) shall be calculated using the following formula:

Measured Availability, 
$$A = \frac{\sum_{z=1}^m (A_z P_z)}{P}$$

where,

$A_z = \frac{\sum_{t=1}^n (C_{t,i})}{n}$ , the percent availability of an Inverter Zone z;

P = The AC nameplate capacity of the entire Facility as defined in Table 3;

P<sub>z</sub> = The AC nameplate capacity of an Inverter Zone as defined in Table 3;

m = The number of Inverter Zones;

$C_t = C_{t,i} * C_{t,m} * C_{t,t} * C_{t,c}$

where,

C<sub>t,i</sub> = The operating state of an inverter station, including the transformer or any component that causes the inverter to be offline, where “On” = 1 if the average

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current measured for the zone during a given Time Interval is greater than 3.0 amps, as measured by inverter instrumentation to eliminate noise or slight zero offset, and otherwise is “Off”, which = 0;

$C_{t,m} = 1 - \frac{F_m}{Q_m}$ , the operating state of a string of modules;

$F_m$  = Quantity of failed strings associated with the Inverter Zone, as measured by amperage inputs at the combiner box;

$Q_m$  = Total quantity of strings associated with the Inverter Zone;

$C_{t,t} = 1 - \frac{F_t}{Q_t}$ , the operating state of a tracker;

$F_t$  = Quantity of failed trackers associated with the Inverter Zone, as measured by the position of each given tracker;

$Q_t$  = Total quantity of combiner boxes associated with the Inverter Zone;

$C_{t,c} = 1 - \frac{F_c}{Q_c}$ , the operating state of a combiner box;

$F_c$  = Quantity of failed combiner boxes associated with the Inverter Zone, as measured by amperage outputs at the combiner box;

$Q_c$  = Total quantity of combiner boxes associated with the Inverter Zone;

$I_t$  = The solar resource state during a given Time Interval, where  $I_t=1$  if the average irradiance based on all site pyranometers in the plane of array is  $> 100$  W/m<sup>2</sup>, and otherwise  $I_t=0$ ; and

$n$  = The number of Time Intervals in the Operating Period, excluding Time Intervals, where  $I_t = 0$  or during Excludable Events.

### **Instrumentation:**

The data collected for the calculation of Measured Availability will be conducted using permanent instrumentation as required to meet the accuracy requirements defined herein. Either Party may elect to use temporary instrumentation to verify accuracy of permanent instruments.

Calibration certificates for all instruments shall be archived by O&M Contractor and copies shall be delivered to Owner.

Instruments used to measure POA solar irradiance shall be no less than two pyranometers with a target measurement uncertainty of no greater than 2% and defined as Secondary Standard by ISO 9060:1990(E) classification and High Quality by the World Meteorological Organization Guide 6<sup>th</sup> Edition. The devices shall be mounted in the plane of the array, calibrated by a qualified technician and heated and ventilated if snow, ice or dew is expected at the location.

### **Data Collection:**

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Data may be logged by the plant data acquisition system, if any, or by the control systems supplied with the major equipment. Data collection will be automated to the fullest extent practical to minimize the need for data collection personnel. All data will be maintained for future analysis. All Acceptable Data collected at each Time Interval during the Operating Period will be applicable. If data for 15% or more of the Time Intervals are either unacceptable or not available due to a data historian malfunction, the Parties shall mutually agree to an alternate data collection method to be utilized in determining Measured Availability.

### **Results:**

Collected data will be analyzed by O&M Contractor to determine which data is acceptable. Certain data will be excluded as defined in the guarantee calculations and based on Excludable Events. All data will be made available to Owner for review and approval of data deemed unacceptable or removed due to an Excludable Event.

A written report will document the results after each Operating Period. The report will include the following items as a minimum:

- Date and time of Operating Period start and finish
- Instrument calibration data with most recent calibration certifications
- Raw data provided in electronic format
- Calculations and correction factors
- Results
- Liquidated Damages calculation (if any)
- Conclusions

### **Excludable Events:**

#### Events beyond O&M Contractor Control

Time Intervals when Force Majeure events reduce the Inverter Zone availability of the Facility will not be counted in the Measured Availability.

#### Major Equipment Manufacturing Defects

Except during the Warranty Period (as defined in the BOT Agreement), including any extension thereof to the extent the relevant equipment remains covered under the Project Warranty (as defined in the BOT Agreement), Time Intervals where major equipment failures (to the extent out of the control of O&M Contractor due to manufacturer defect) reduce the Inverter Zone availability of the Facility will not be counted in the Measured Availability.

#### Construction Manager Warranty Remediation

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Except during the Warranty Period, including any extension thereof to the extent the relevant equipment remains covered under the Project Warranty, Time Intervals where original construction workmanship results in reduced Inverter Zone availability of the Facility will not be counted in the Measured Availability.

Snow or Ice

Time Intervals when snow or ice covers the array inhibiting Inverter Zone power production regardless of irradiance measurement will not be counted in the Measured Availability.

Spare Part Availability

Except during the Warranty Period, including any extension thereof to the extent the relevant equipment remains covered under the Project Warranty, Time Intervals when spare parts (excluding Consumables and routine minor parts required for Scheduled Maintenance) are not available due to the absence of manufacturer supply or have not been procured as part of the initial spare parts inventory will not be counted in the Measured Availability.

Missing or Flawed Data

Time Intervals will only include periods for which Acceptable Data exists. All other data shall be excluded from the Measured Availability.

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