

## Model Equipment Availability Terms

Capacity is a physical property of the PV system and installed components. Capacity will only be reduced when a component integral to power production fails (and becomes unavailable). Individual components will also have capacities associated with them. The total of all component capacities will comprise the plant Capacity. Capacity can then be used as an input to compute full PV system availability, as that is an expected usual goal. With that, use the following formula:

Where:

Theoretical Total Production time(H<sub>ttp</sub>):

The hours in the Period when sufficient sunlight exists to allow the inverters to reach the input voltage needed to operate.

Nameplate Power (KW<sub>np</sub>):

The nameplate power rating of the entire solar generating facility determined by the sum of each modules nameplate kWp rating.

Component Unavailability Hours (H<sub>un</sub>):

The hours in the Period when solar irradiance is sufficient to power the inverters, yet a component within the Facility is not available to generate power due to an equipment fault.

Derated System Power (KW<sub>dr</sub>):

The value for unavailability derated system power will be calculated by the amount of unavailable DC nameplate capacity for the Period and is determined by sum of each modules nameplate kWp rating for that given unavailable component.

Incident: Every outage incident during the measurement period.

Note 1: KW<sub>dr</sub> describes the fractional capacity reduction (not due to degradation)

Note 2: This calculation does not consider cumulative degradation which should be calculated and tracked separately along with energy production

Mandatory — Information categories    Availability =  
1 – unavailability

### **MEANING OF COLORS:**

**GREEN** = included in period hours as available

## **Figure X. Model contract language**

This approach is a tool and the users can deviate from the listed inclusions and exclusions as appropriate, and further identify and define them for purposes of the contract.

Stated simply, unavailability events must be tracked and the capacity reduction expressed as a percentage is the availability for the duration of the period respective outages. Care must be taken to avoid double counting and this should be reflected in the contract terms. IEC 63019 will have guidance for prioritizing outages; i.e. grid outage concurrent at the time of an inverter outage which usually prioritize keeping components available (internal) verses external factors of control of the operator.

For contracts, a table used to summarize, calculate and categorize contract exclusions, energy gains and losses due to performance, energy gains and losses due to availability, and their associated contract penalties or rewards may be useful. By using a summary table, the parties may easily calculate offsets of losses in one area with gains in another.