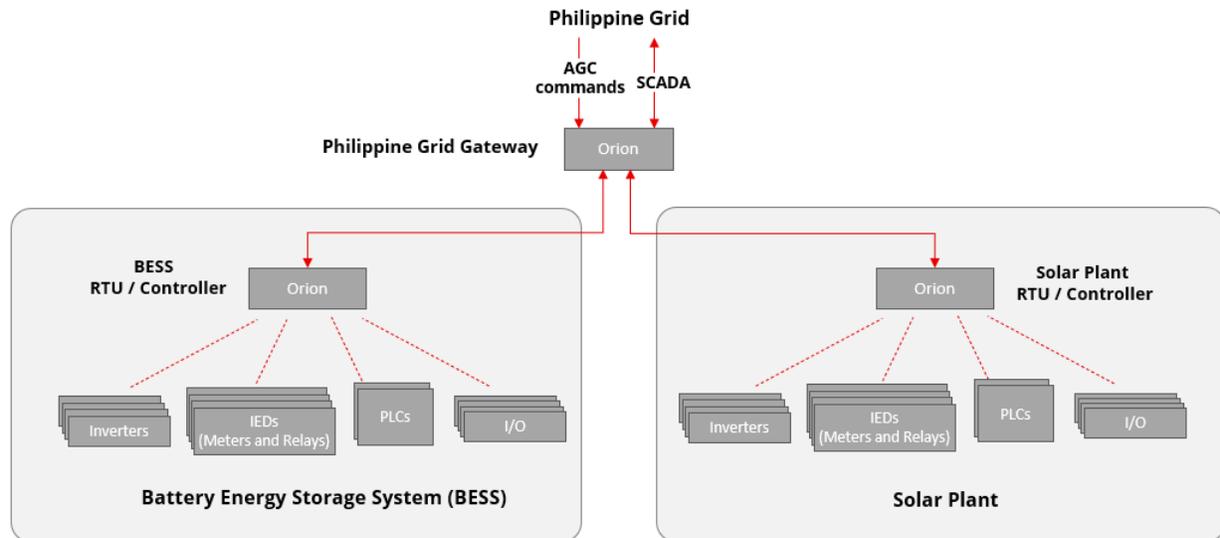


# Solar Farm Monitoring and Control in the Philippine Grid



NovaTech Channel Partner, NTA Energy Solutions, provides complete monitoring and control systems for grid scale solar up to 40MW. The systems include inverter control, bulk energy storage coordination, AGC support and complete metering. This note describes a typical system for an 18MW solar plant.

**Philippine Grid Gateway** may be installed on either the BESS / Solar Plant facility or on the nearest substation of the Philippine Grid. Automatic Generator Control (AGC) functions of the Philippine Grid are received through the Gateway to be passed to the RTU. Custom Orion logic, required by the Philippine Grid, is implemented on this RTU.

**RTU / Controller** for the Solar Farm or BESS. Includes:

- Custom Logic for control of the inverters (MW, MVAR, MVA limits, frequency control)
- Built-in HMI for visualization of the Solar Plant / BESS including metering, status and controls. Two approaches:
  - Simpler, lower-cost approach: use built-in Orion HMI with storage PC
  - Higher-cost, server-based HMI for larger integrated storage
- Software / utility designed by NTA Energy Solutions that queries the data from the OrionLXm PostgreSQL database and transfers the data towards the PostgreSQL database Server of the Solar Plant.
- Custom Reports, also created by NTA Energy Solutions for the reports and data required for the compliance of the Solar Plant with the regulators.

**Orion DDIO / DCIO** for discrete SCADA data: alarms, breaker status, etc. plus analog inputs (4-20mA) for transformer oil and winding temperature, and tap position.

**Bitronics M650 Meters** for monitoring outgoing line and totalizing high side and low side.