# Validation of a Energy Management Strategy for a BIPV System with a Vanadium Battery Demonstrator

Luis Fialho<sup>1</sup>, Tomás Fartaria<sup>1</sup>, Manuel Collares Pereira<sup>1</sup> <sup>1</sup> ST Renewable Energies Chair, Universidade de Évora, Portugal

## **BIPV System Demonstrator**

### Vanadium redox flow Battery:

- 5 kW nominal power
- 60 kWh capacity

Battery Inverters: 3x2.4 kW nominal power

PV installation: 6.74 kWp (m-Si and p-Si)

PV inverter: 12.5 kW nominal power (2 MPPT)

Three phase installation







### Self Consumption Optimization Strategy

6000

W) Jower

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### **General Objective:**

Study of grid interface in rooftop PV systems with energy storage.

The specific objective for this energy strategy is to maximize the consumption of locally produced PV power, hence minimizing the S injection of power into the electrical grid. Power

### **Implementation:**

 $P_{setBat} = P_{pv} - P_{load}$ 

$$P_{grid} = P_{setBat} - P_{bat}$$

Due to technical operational limits (voltage SOC), and а control to avoid overdischarge/charge was implemented.

### **Conclusions:**

CROPS

The strategy achieved a minimized peak power (1.4kW) exchange with the grid, even at lower SOC levels (SOC<30%).

P<sub>setBat</sub> AC Power command to battery inverter P<sub>nv</sub> PV AC power Pload Loads AC power consumption  $P_{grid}$ AC Power exchange with the grid  $P_{bat}$ Measured battery inverter AC power SOC Battery state of charge



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For more information see also poster "Performance Characterization of a Vanadium Redox Flow Battery".

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