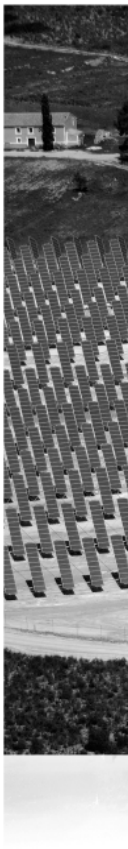
voltalia



BOL01 BOLEBEDU

TECHNICAL DESCRIPTION BESS

1 INTRODUCTION

The present document is a Technical Description of a Battery Energy Storage System (BESS) that will be installed in the Bolebedu PV Plant.

2 SOLUTION DESCRIPTION

2.1 Overview of the ESS

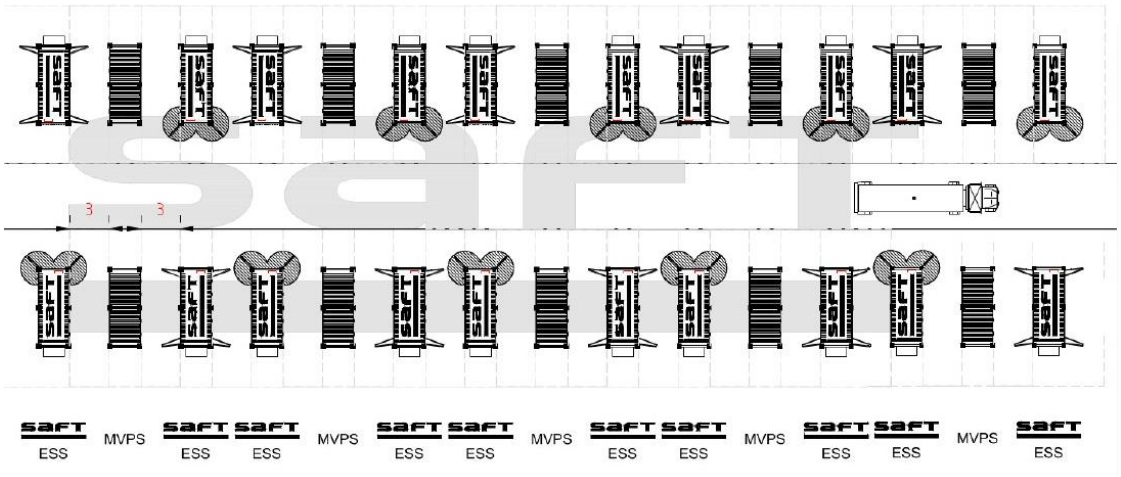
2.1.1 Equipment overview

The overall system performances are detailed in the table below.

Equipment	Reference	Nb
Battery container	Li-ion SAFT INTENSIUM HIGH ENERGY IHE / 1x20' containerized fully populated / Li-Ion LFP	26
PCS/MVPS	SMA SCS 2300 (or equivalent tier 1) MVPS included	13
PMS	SMA HYCON, Power plant controller (or equivalent tier 1)	1
Nominal Power		30 MW
Storage Capacity		60 MWh

2.1.2 Preliminary layout

Associated with the architecture planed for the project, the layout will follow the following philosophy:



2.1.3 Battery container

The battery container details are available in table below.

Parameter	Solution
Battery model	IHE 1500
Battery technology	Li-Ion LFP

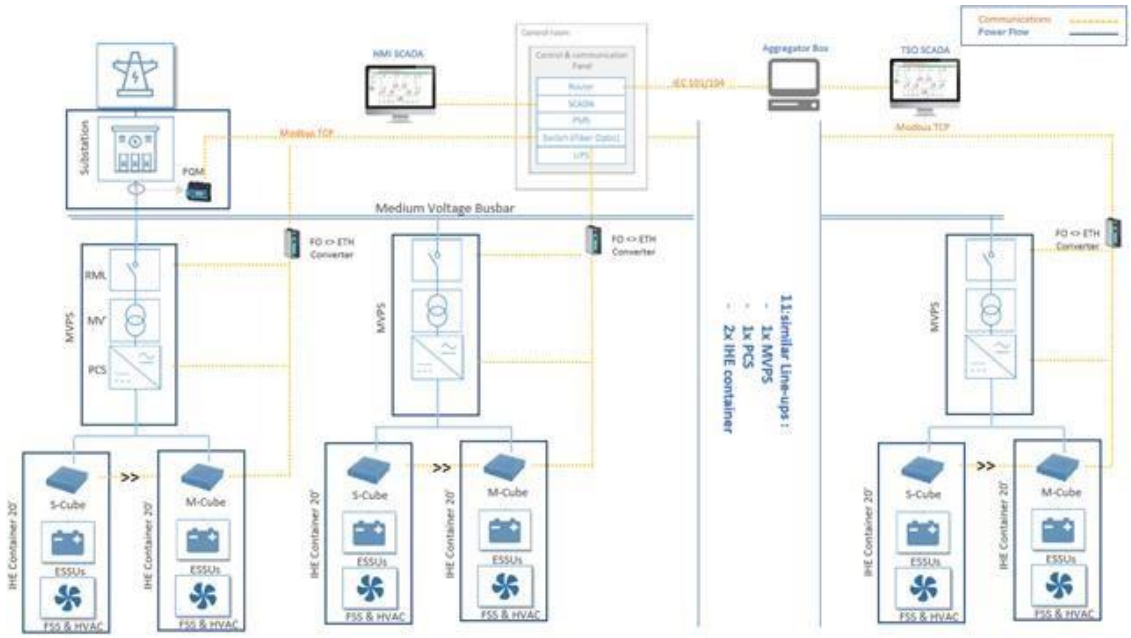
2.1.4 53. PCS

The PCS details are available in table below.

Characteristic	Description
Manufacturer	SMA
PCS Type	SCS2300XT
AC Rated Power PCS @ 40˚C	MVPS
DC Voltage Range PCS	2430kVA
PCS Output Voltage	880-1500V
PCS AC current 50˚C	480-720V
Max PCS efficiency	2566 A

2.1.5 Power Management System

The BESS will have the following architecture in figure below.



The solution proposed is described in the table below.

Characteristic	Description
Supplier	SMA (or tier 1 equivalent)
Model	HYCON Hybrid controller – Power plant Manager

The PMS software is designed for real time supervision, control and operation of the system in different operation mode. A remote monitoring could be granted if internet access is provided at project site.

The PMS controls the equipment in real time based on the chosen control mode and plant measurements. This controller also provides a proper response to unexpected events (e.g. communication loss, equipment failure). For the application the PMS is able to perform following control functions:

Control mode	Description
Frequency Response	The ESS automatically responds (active power injection/absorption) to a change in the grid frequency with the purpose to counteract this change in frequency
Active Power Regulation	The ESS follows active power setpoints sent by the TSO (e.g. Automatic Governor Control setpoint)
Reactive Power Regulation	The ESS follows reactive power setpoints sent by the TSO
Reactive Power Control	The ESS automatically responds (reactive power injection/absorption) to a change in the grid voltage with the purpose to counteract this change in voltage.
Power Factor Control	The ESS injects / absorbs reactive power with the purpose to achieve a defined power factor at its output
SoC Management	This control modes activates the charge / discharge of the ESS depending on internal (e.g. SoC) or external conditions (e.g. price signal, load level, etc.)
Ramp Rate Control	The ESS adapts its active power injection / absorption with the purpose to smooth its power output
Black-start	Harness the black-start capability of the PCS to start a local grid in the event of a loss of power
Peak Shaving	The ESS will charge / discharge either to limit the power produced by the generators or consumed by the load
Arbitrage	The ESS will charge / discharge based on a price signal
Islanding	Harness the islanding capability of the PCS to island the local grid from the electricity network