

**Kokam**

A business partner  
You can depend on



System Integrator  
Energy Storage Solution Provider

[www.kokam.com](http://www.kokam.com)  
[battery@kokam.com](mailto:battery@kokam.com)

**Kokam**

*DISCLAIMERS OF WARRANTIES*

ALL MATERIALS AND SERVICES ON THIS DOCUMENT ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR THE WARRANTY OF NON-INFRINGEMENT. THIS DOCUMENT COULD INCLUDE TECHNICAL OR OTHER MISTAKES, INACCURACIES OR TYPOGRAPHICAL ERRORS. KOKAM ASSUMES NO RESPONSIBILITY FOR ERRORS OR OMISSIONS IN THE INFORMATION, DOCUMENTS, SOFTWARE, MATERIALS AND/OR SERVICES WHICH ARE REFERENCED BY OR LINKED TO THIS DOCUMENT. KOKAM DOES NOT GRANT ANY EXPRESS OR IMPLIED RIGHT TO ANY PERSON OR BUSINESS ENTITY UNDER ANY PATENTS, COPYRIGHTS, TRADEMARKS, OR TRADE SECRET INFORMATION WITH RESPECT TO THE MATERIALS AND SERVICES. NO PORTION OF THE INFORMATION OR DOCUMENTS MAY BE REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN CONSENT OF KOKAM. IN NO EVENT SHALL KOKAM BE LIABLE TO ANY PERSON OR BUSINESS ENTITY FOR ANY SPECIAL, PUNITIVE, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES BASED ON ANY USE OF THIS DOCUMENT.

# 35MW/11MWh ESS Project in Western Australia



Transformer

PCS Container

Battery Container

PCS Container

Transformer

Battery Container

Battery Container

PCS Container

Transformer

Transformer



Battery Cell   Pack/System   BMS   Battery container   **EPC**  
 PCS   Transformer   EMS   Engineering Construction

Total Solution Provider  
**An Experienced Battery Solution Provider**

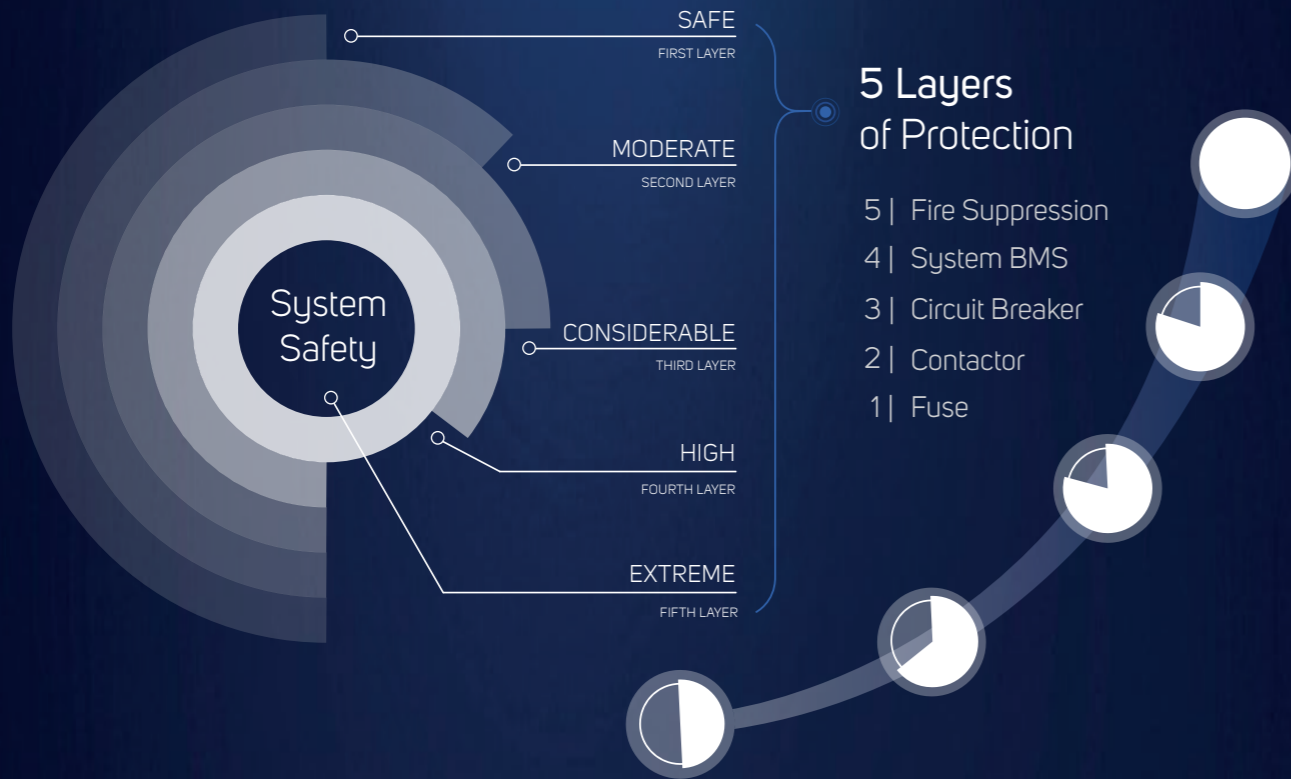
Kokam manufactures Lithium-Ion/Polymer Batteries, Battery Management Systems, and Energy Storage Systems. Kokam's solutions are being utilized in over 50 different countries for various applications.

In 1989 Kokam manufactured high capacity Lithium-Ion batteries. Since then, Kokam has become a global battery industry leader within 60 worldwide patents related to battery technology and battery manufacturing equipment. In addition to offering customers a wide range of standard battery solutions, Kokam also works with customers to create customized solutions to address their unique needs.

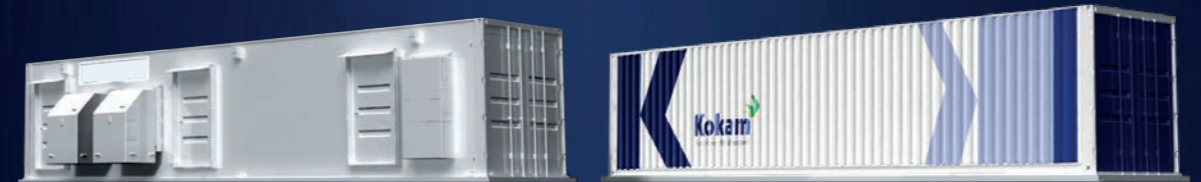
Kokam manufactures over 30 different types of Lithium-Ion/Polymer batteries for Energy Storage System, Defense, Marine, Aerospace, Telecom, Electric Vehicle, and Medical applications. With 31 years of field experience, Kokam has installed over 600MWh of batteries around the world. Kokam's innovative solutions deliver high performance, and are reliable, durable, and exceptionally safe.

## 31 Years of experience

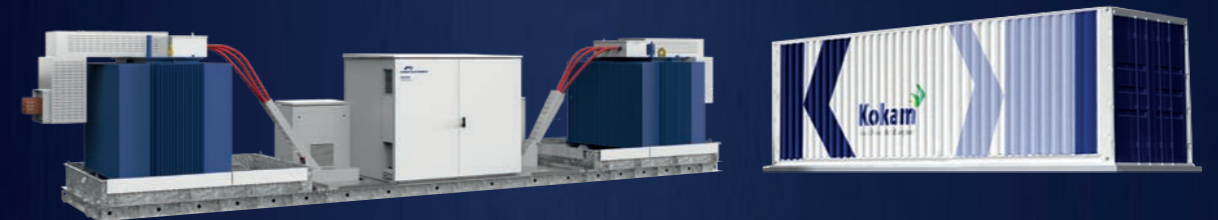
- Total 264MW ESS installed all around the world (4Q, 2019)  
 - Affiliate of SolarEdge (4Q, 2018) 2017  
~2020
- Installed 36MW FR ESS in Nongong, Korea  
 - Installed 35MW Spinning Reserve ESS in Australia  
 - Delivered 10MWh Behind The Meter ESS 2016
- Installed 24MW FR ESS in Shin Gimje, Korea  
 - Installed 16MW FR ESS in Shin Chungju, Korea  
 - Developed of the Ultra High Power Cell 2015
- Installed 16MW FR ESS in West Ansong, Korea  
 - Completion with 3rd Factory in Nonsan, Korea  
 - Developed speicalized battery for high quality ESS 2013  
~2014
- Invested in Sunverge located in U.S  
 - Completion of Battery Plant in U.S for 700MWh Capacity  
 - Set up the 2nd Factory in Nonsan, Korea  
 - Establishment of limited battery manufacturing license in the U.S 2011  
~2012
- Installed Mutiple MWh ESS in U.S  
 - Development of Nano cell  
 - Founded joint venture in U.S 2009  
~2010
- Strated manufacturing the LTO Battery  
 - Development of the high capacity cell(>200Ah)  
 - Establishment of Kokam Electronics for Total Battery Solutions 2006  
~2008
- Developed extreme high discharge performance 20C-rate & 30C-rate cell  
 - Started with machinery sales  
 - Exported turnkey technology of SLPB  
 - Developed large capacity of SLPB 2002  
~2005
- Beginning of the battery business  
 - Development SLPB (Superior Lithium Polymer Battery) 1999  
~2001
- Establishment of KOKAM 1989



## ESS Solution (Battery + PCS + Transformer + EMS)



6MW PCS (40ft) + Transformer + 4MWh Battery (40ft)



2MW PCS + Transformer + 2MWh Battery (20ft)

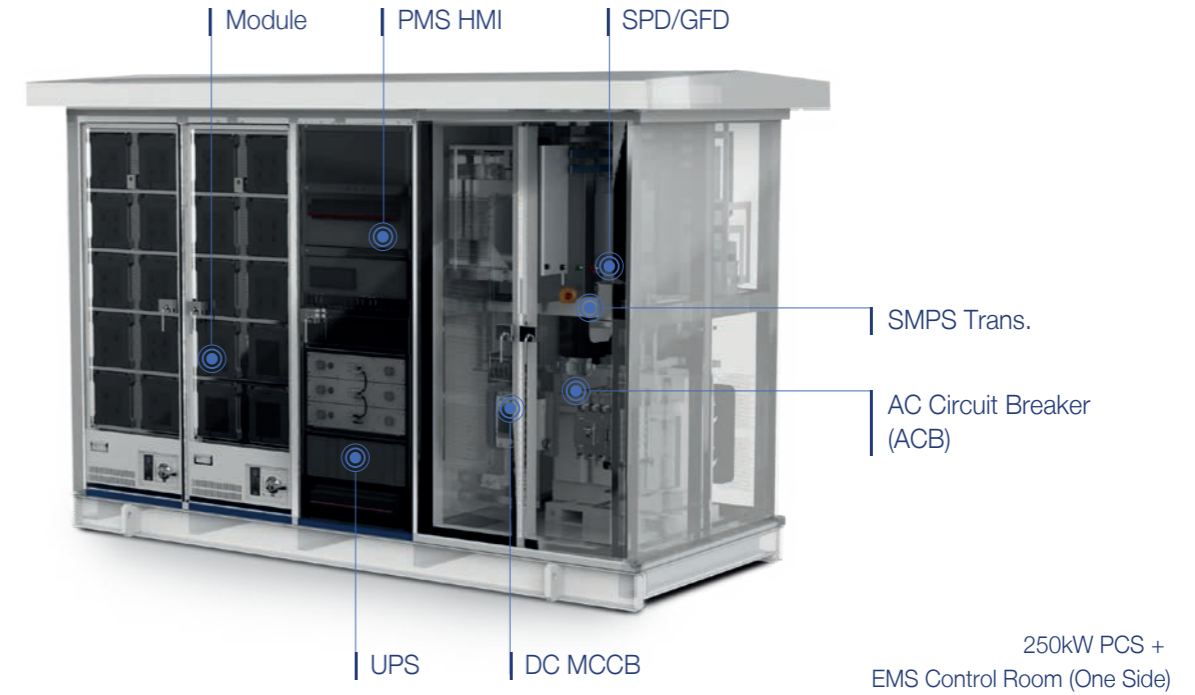


EMS (Energy Management System)



⦿ HVAC System

- Racks are directly cooled by the HVAC system (1/6 of entire container volume) so cool air reaches the heat source directly.
  - Cooling is fast and very efficient.
  - Ambient conditions do not affect operation.
- Compared to general system, Kokam system saves 70% of power consumption



## Completely Integrated Battery Solution

Cell  
Module  
Outdoor Rack

BMS (Module, Master)  
BPU(Battery Protection Unit)  
Fire Suppression System

PCS( Power Conversion System)  
EMS(Energy Management Software)  
Transformer

## 250kW/500kWh Outdoor ESS (Battery + PCS + EMS)

Renewable Integration  
Demand Response  
Ancillary Grid Support  
Microgrid Application

3 phase 3 wire system / 3 phase 4 wire system  
Communication protocol - EMS: DNP3.0, IEC61850  
IP44 Rated Battery Enclosure  
4,400 x 2,000 x 2,800 (L x W x H / mm)

	Item	Specification
Battery	Installed Energy	500kWh
	Operating Voltage Range	670 ~ 830V
	Operating Temperature	-20 ~ 50℃
PCS	Power	250kW
	Cooling System	Forced Air-cooling
	Communication Protocol	EMS: DNP3.0, IEC61850
System	Dimension (L x W x H / mm)	4,400 x 2,000 x 2,800

