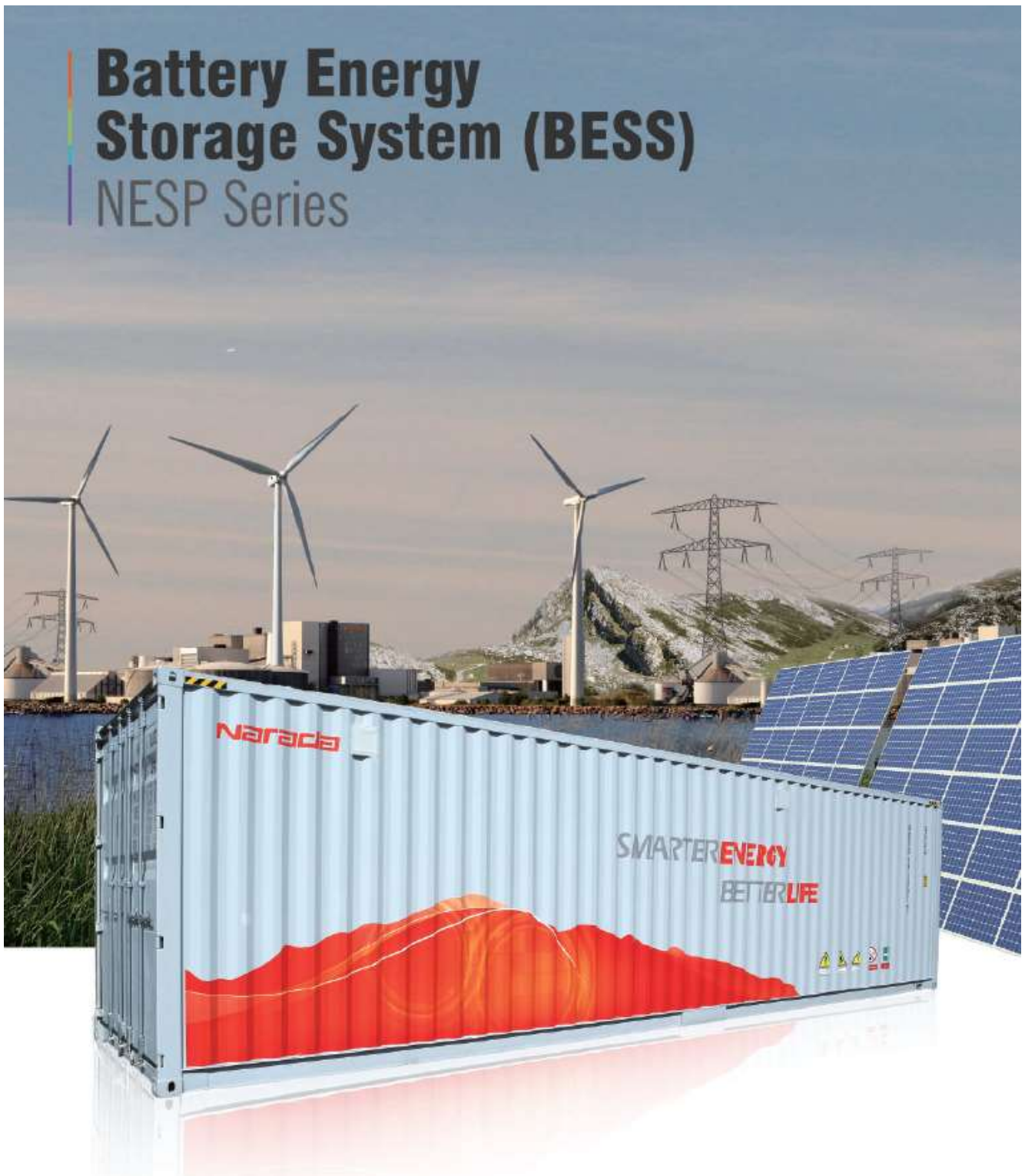


# Narada®

## Battery Energy Storage System (BESS) NESP Series

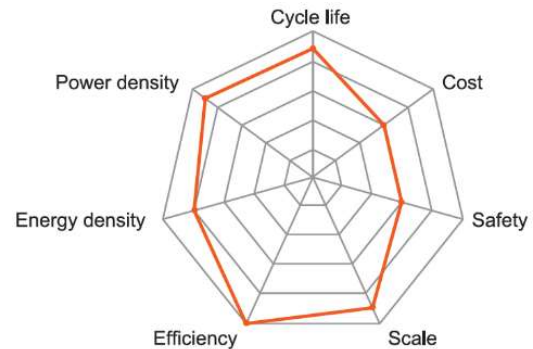


## NESP Series

LFP, Lithium Iron Phosphate Battery Solutions

## Cell Technology

- | **Lithium Iron Phosphate**  
Industry preferred LFP technology
- | **Stacking Plates**  
High power and thermal dissipation
- | **Prismatic Cell**  
Multi-layered protection at cell level
- | **Aluminum Case**  
Excellent thermal conductivity  
Safe and efficient cooling



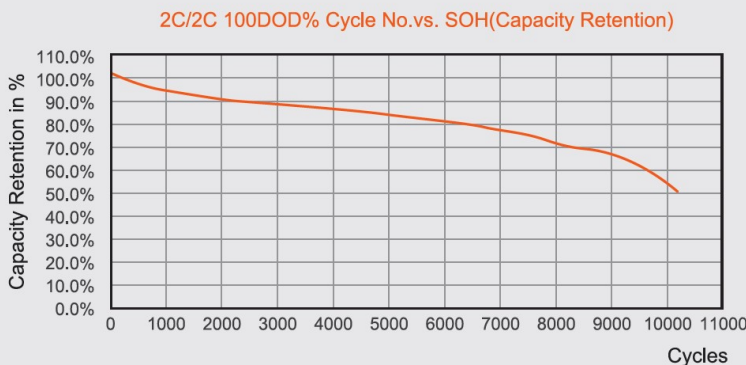
## Sustainable Design

Continuously innovating to increase energy density while maintaining the same form factor and cell dimensions, thus facilitating future upgrades to higher capacity and energy density with no change to module and rack design.

Cell Model	FE80B	FE105A	FE125A	Unit
Weight	2.15	2.45	2.75	kg
Length	130			mm
Width	37			mm
Height	243			mm
Nominal Capacity	80	105	125	Ah
Nominal Voltage	3.2			V
Allowed C-Rate	2	2	2	C
Recommended C-Rate	2	1	0.5	C

## Long Cycle Life and Multi-Industry Use

Extensive application and experience in Telecom, Energy Storage, Data Centers, Automotive.



### Long Cycle life

2000 cycles @90%SOH  
6000 cycles @80%SOH  
10000 cycles @70%SOH

### Wide application & experience

Telecom since 2010  
BESS since 2011  
Automotive since 2012

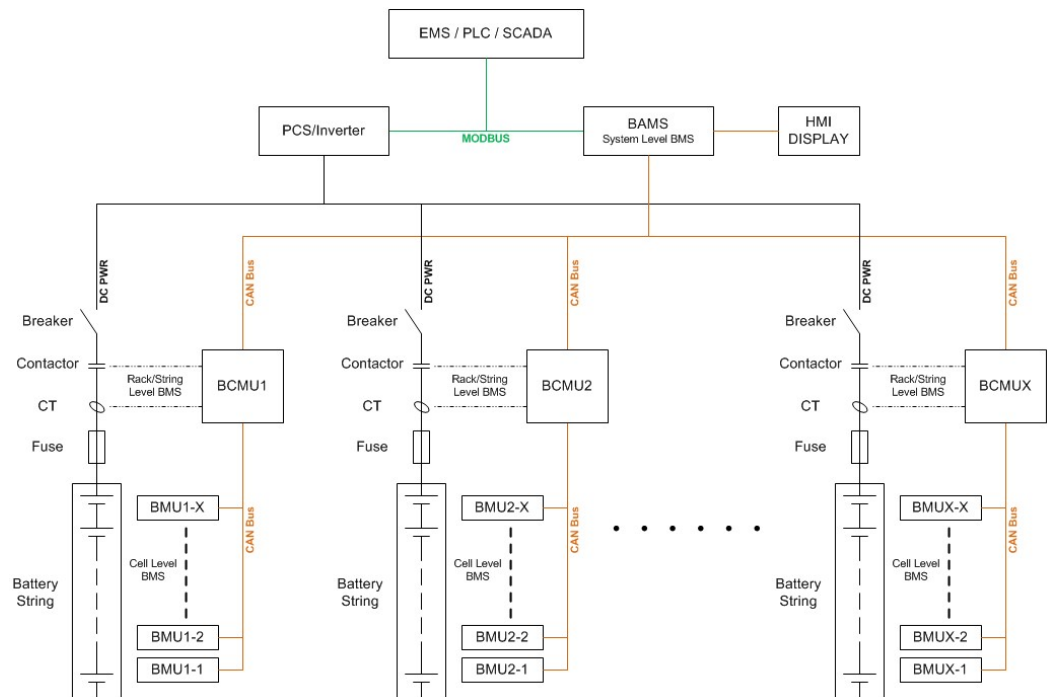
## Features of Module & Rack Design

- | Common Platform for Energy and Power Solutions
- | 0.5C to 2.0C options available
  - Frequency Regulation
  - Peak Shaving
  - Peak Shifting
  - Curtailement/Demand Response
  - Reserve Power
- | High LFP Energy Density
  - Optimizes footprint and BOP costs
- | Passive & Active Thermal Ventilation
  - Designed in both module and rack
- | Designed for containerized solutions
- | High Lifetime Performance



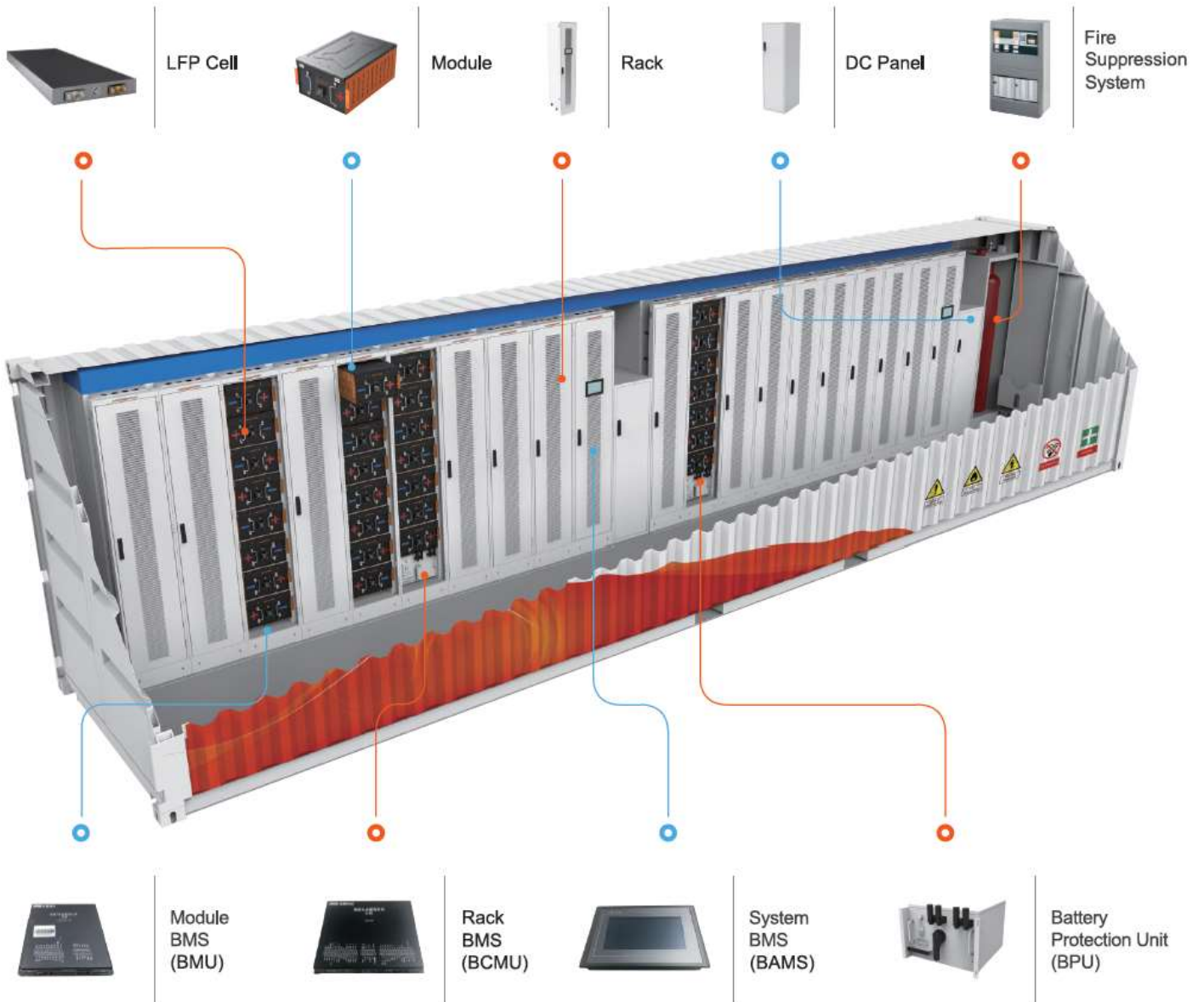
## BMS Functions

- | Conditions Monitoring
- | State of Charge, SOC
- | State of Health, SOH
- | Discharge Control
- | Thermal Management
- | Fault Alarms
- | Balancing
- | Protection



NESP Containerized Solution

- | Cells
- | BMS
- | DC Panel
- | Modules
- | Battery Protection
- | HVAC System
- | Racks
- | Container
- | Fire Suppression



## NESP Module & Rack Specification

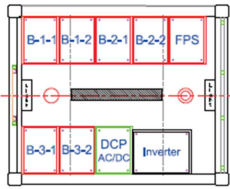
ITEM		MODULE (32 Cells)	RACK TYPE 1 (11 Modules)	RACK TYPE 2 (13 Modules)	RACK TYPE 3 (15 Modules)
Type No.	2C	51.2NESP160	5128097	51280114	51280132
Capacity	Ah	172	172	172	172
Energy	kWh	8.8	97	114	132
Nominal Voltage	V	51.2	563.2	665.6	768.0
Minimum Voltage	V	44.8	492.8	582.4	672.0
Maximum Voltage	V	57.6	633.6	748.8	864.0
Dimensions W x D x H	mm	415x600x265	500*650*1800 (2 pcs)	500*650*2100 (2 pcs)	500*650*2400 (2 pcs)
Weight	kg	73.8	936.8	1084.4	1232

ITEM		MODULE (32 Cells)	RACK TYPE 1 (11 Modules)	RACK TYPE 2 (13 Modules)	RACK TYPE 3 (15 Modules)
Type No.	1C	51.2NESP200	512100118	512100140	512100161
Capacity	Ah	210	210	210	210
Energy	kWh	10.8	118	140	161
Nominal Voltage	V	51.2	563.2	665.6	768.0
Minimum Voltage	V	44.8	492.8	582.4	672.0
Maximum Voltage	V	57.6	633.6	748.8	864.0
Dimensions W x D x H	mm	415x600x265	500*650*1800 (2 pcs)	500*650*2100 (2 pcs)	500*650*2400 (2 pcs)
Weight	kg	83.4	1042.4	1209.2	1376

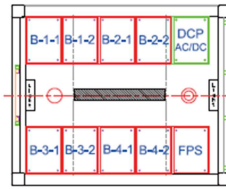
ITEM		MODULE (32 Cells)	RACK TYPE 1 (11 Modules)	RACK TYPE 2 (13 Modules)	RACK TYPE 3 (15 Modules)
Type No.	0.5C	51.2NESP250	512125141	512125166	512125192
Capacity	Ah	250	250	250	250
Energy	kWh	12.8	141	166	192
Nominal Voltage	V	51.2	563.2	665.6	768.0
Minimum Voltage	V	44.8	492.8	582.4	672.0
Maximum Voltage	V	57.6	633.6	748.8	864.0
Dimensions W x D x H	mm	415x600x265	500*650*1800 (2 pcs)	500*650*2100 (2 pcs)	500*650*2400 (2 pcs)
Weight	kg	93	1148	1334	1520



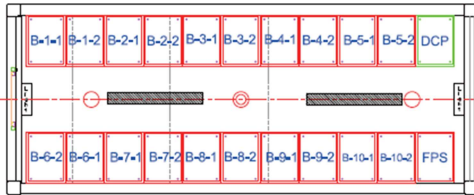
General Layout of Containerized Solutions



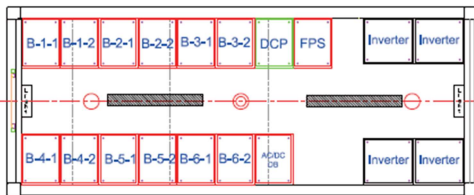
10 ft ISO HC Container  
 External Mounted HVAC  
 Max Rack Energy 192kWh  
 Max Container Energy 0.576MWh  
 Max Container Power 0.25MW



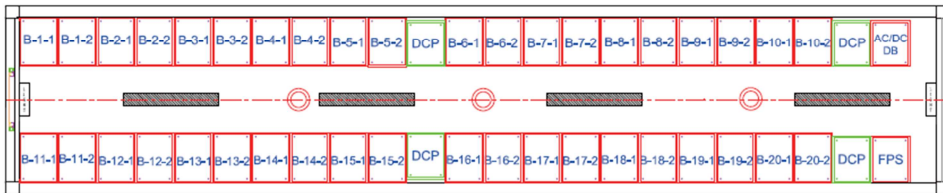
10 ft ISO HC Container  
 External Mounted HVAC  
 Max Rack Energy 192kWh  
 Max Container Energy 0.768MWh



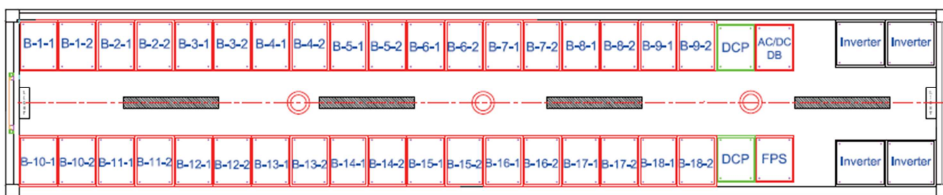
20 ft ISO HC Container  
 External Mounted HVAC  
 Max Rack Energy 192kWh  
 Max Container Energy 1.92MWh



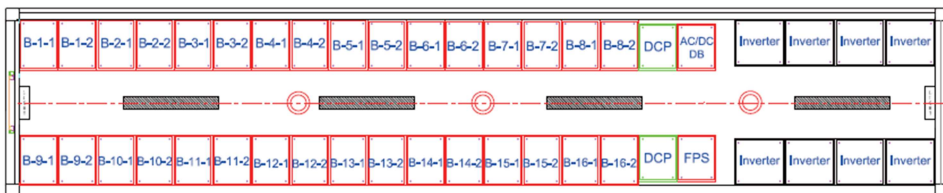
20 ft ISO HC Container  
 External Mounted HVAC  
 Max Rack Energy 192kWh  
 Max Container Energy 1.15MWh  
 Max Container Power 1.0MW



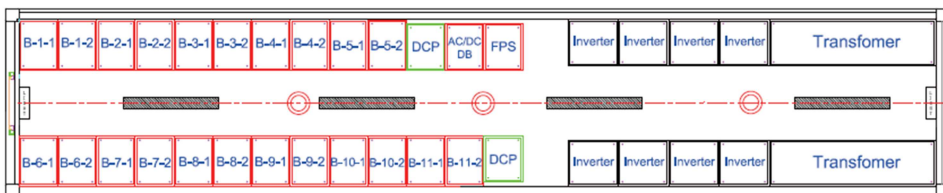
40 ft ISO HC Container  
 External Mounted HVAC  
 Max Rack Energy 192kWh  
 Max Container Energy 3.84MWh



40 ft ISO HC Container  
 External Mounted HVAC  
 Max Rack Energy 192kWh  
 Max Container Energy 3.45MWh  
 Max Container Power 1.0MW



40 ft ISO HC Container  
 External Mounted HVAC  
 Max Rack Energy 192kWh  
 Max Container Energy 3.07MWh  
 Max Container Power 2.0MW



40 ft ISO HC Container  
 External Mounted HVAC  
 Max Rack Energy 192kWh  
 Max Container Energy 2.11MWh  
 Max Container Power 2.0MW  
 Max Transformer 2.0MVA

## Codes and Standards

Fully compliant with U.S. market codes and standards.

SAFETY	
UL9540	Safety for Energy Storage Systems and Equipment
UL9540A	Test Methods for Evaluating Thermal Runaway Fire Propagation - BESS
UL1973	Batteries for Use in Stationary Applications
UL1642	Standards for Lithium Batteries
IEC62619	Safety for Secondary Lithium Cells and Batteries
IEC61508, UL991, UL1998, UL60730-1	Functional Safety for Electrical Systems
NFPA 70E	Standard for Electrical Safety in the Workplace
NFPA 70	NEC, National Electrical Code
ANSI/IEEE C-2	National Electric Safety Code
UL60950	Electrical Insulation
NFPA 551 / NFPA 550	Fire Detection and Suppression
IEC 60812	
IEC 61025	Safety Analysis and Control System (FMEA, FTA)
MIL-STD-1629A	
UL1778	UPS for Ancillary
UL1598	
UL8750	Luminaires
UL1012	Rectifier for DC power supply
UL1995	Air Conditioner for Cooling
UN 38.3 / IEC 62281	Transportation Safety of Lithium metal and Lithium ion batteries
Performance Standards & Grid Interconnect	
IEC61427-2 2015	Secondary cells and batteries for renewable energy storage – General requirements and methods of test – Part 2: On-grid applications
IEC 62620	Secondary Lithium Cells and Batteries for Industrial Applications
PNNL-22010	Protocol for Measuring Performance of Energy Storage System
UL 1741 (SA)	Standards for Inverters, Converters, Controllers and Interconnection System Equipment
IEEE1547	Standard for Interconnecting DR with EP
ANSI/IEC 60529	Degrees of Protection Provided by Enclosures
NEMA 250	Enclosures for Electrical Equipment
NEMA 250 / UL50E	Environmental Considerations for Electrical Equipment Enclosures
IEEE 693-2005	Recommended Practice for Seismic Design of Electrical Equipment

### Global Track Record

Since 2011, Narada's BESS products have been successfully operating in over 14 countries.

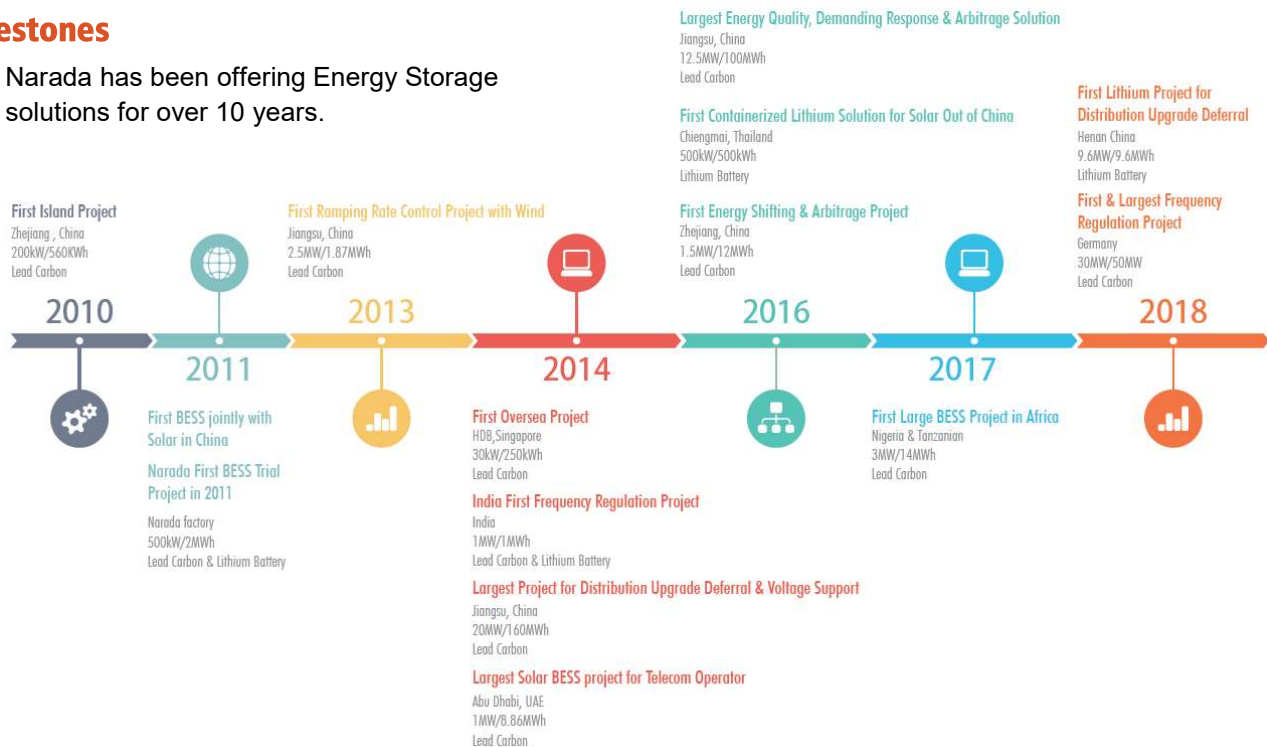
SINCE **2011** | TOTAL **190MW/1.1GWh** | COUNTRIES **14**



Europe	Asia Pacific	China
<b>Germany</b> Mockrehna 30MW / 50MWh  <b>UK</b> 36 kW / 33 kWh <b>Spain</b> 0.25 MW / 0.4 MWh	<b>India</b> 1.4 MW / 1.4 MWh  <b>Australia</b> 60 kW / 262 kWh <b>Pakistan</b> 150 kW / 150 kWh <b>Philippines</b> 200 kW / 200 kWh <b>Thailand</b> 0.55 MW / 0.62 MWh <b>Singapore</b> 0.15 MW / 1.250 MWh <b>Saudi Arabia</b> 9 kW / 21.6 kWh  <b>Nigeria</b> 6 kW / 13 kWh <b>Saudi Arabia</b> 9 kW / 21.6 kWh <b>UAE</b> 1MW / 8.9MWh (multiple sites) 	<b>Jiangsu (35 Sites)</b> 104 MW / 812 MWh  <b>Qinghai (3 Sites)</b> 15.5 MW / 122 MWh <b>Guangdong (7 Sites)</b> 6.2 MW / 26 MWh <b>Zhejiang</b> 6.3 MW / 25 MWh <b>Beijing (7 Sites)</b> 1.5 MW / 18.3 MWh <b>Henan</b> 9.6 MW / 9.6 MWh  <b>Hebei (3 Sites)</b> 2.1 MW / 12.5 MWh <b>Hubei</b> 1.5 MW / 9 MWh <b>Xinjiang (3 Sites)</b> 2.1 MW / 5 MWh <b>Inner Mongolia (2 Sites)</b> 1.1 MW / 2.6 MWh

### Milestones

Narada has been offering Energy Storage solutions for over 10 years.







Zhejiang Narada Power Source Co., Ltd. Was established in 1994 and has been publicly listed on the Shenzhen Stock Exchange since 2010. Narada specializes in providing energy system integration products, solutions, and operation services to Information and Communication Technology (ICT), Renewable Energy Storage, Electric Vehicles (EV), and other energy saving applications. With decades of development, Narada has become the leader in global industrial batteries. The “Narada” brand is well known worldwide.



Credibility



Responsibility



Creativity



Devotion

