



Company Introduction

ALPHA ENERGY STORAGE SOLUTION CO., LTD.

JUNE, 2015

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Our Concentration



vs.



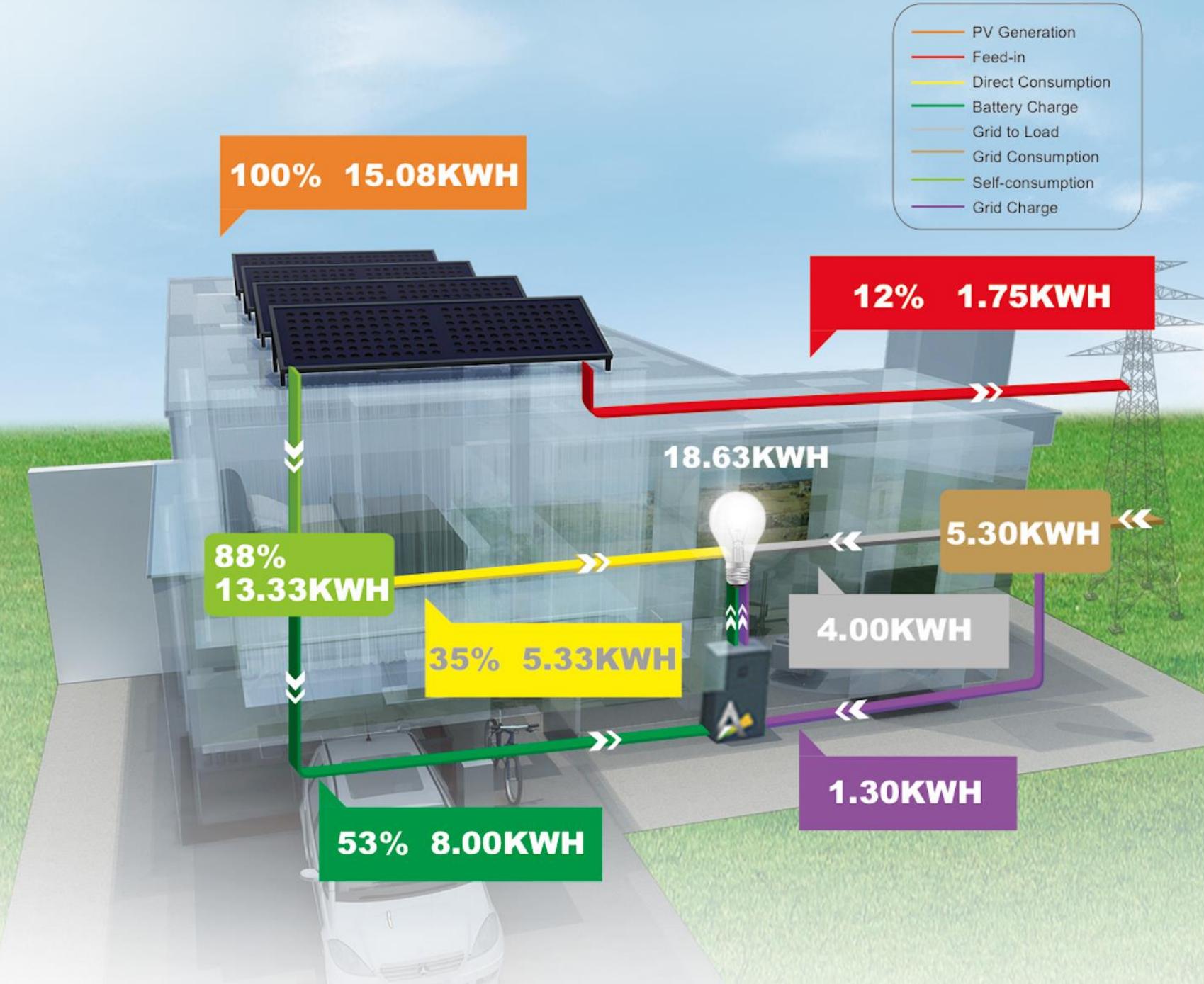
*Without ESS
PV energy is not
sustainable.*

*Without PV
storage system is not
profit-efficient for now.*

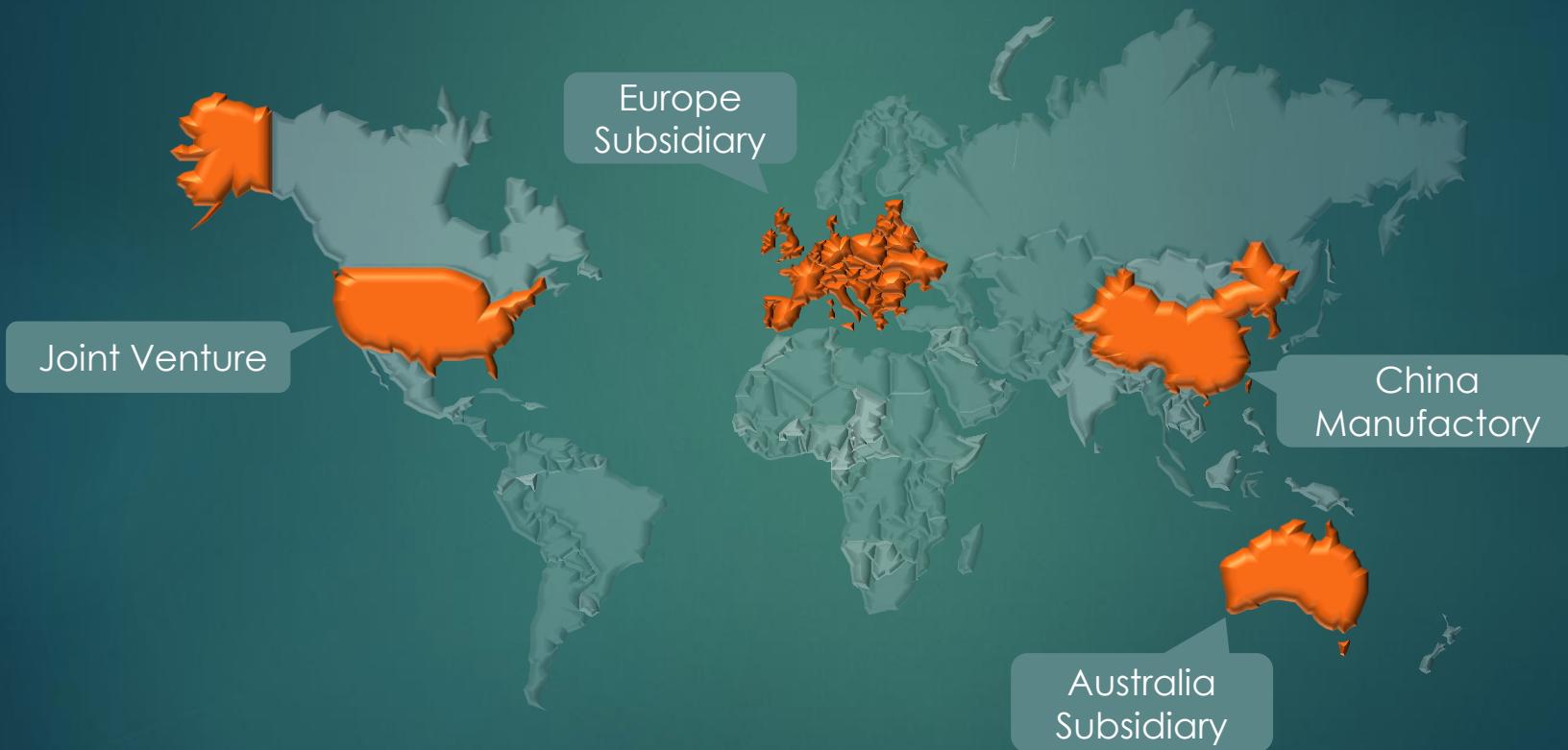
Our Concentration



AlphaESS provides Energy Storage Solution
specifically designed for PV market.



Our Markets



Milestones

Company

Headquarter founded

EMS

Product

2012

2013

2014

2015



- Sales & Marketing subsidiary founded



- EMS

- Battery module: M4850-M
- Inverter: AEV-3048



- Europe Subsidiary
- Australia Subsidiary
- American Market
- 6000m² new manufactory

- Intersolar Exhibition



- Product Family



- AlphaESS-CS001

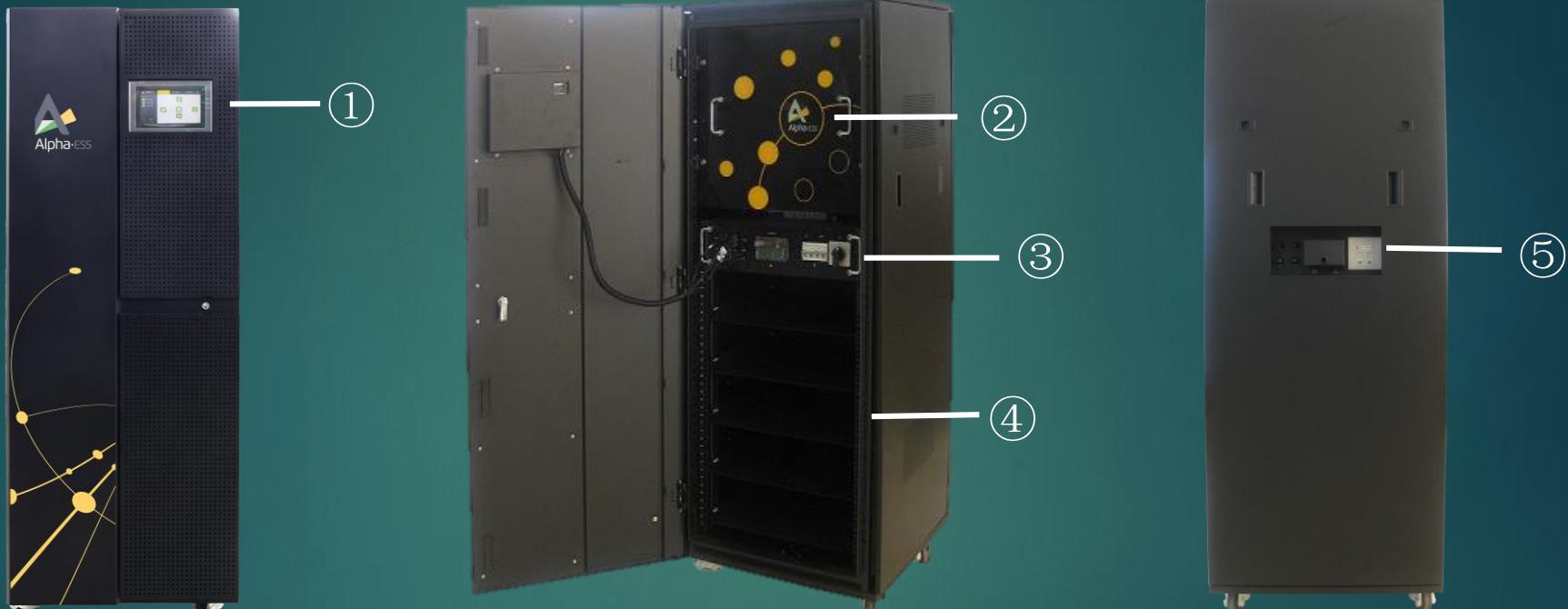


Products



STORION			Alpha-Centauri	Storion PowerPlug
S3	S5	T6	3KW	2.5KWh/pcs

STORION — STORAGE Lithium-ION



① EMS LCD touch panel

② EMS LCD touch panel

⑤ Connection ports
on backside

③ Inverter (behind logo panel)

④ Cable box

STORION-Cabinet

Cabinet

Outline Dimensions (WxDxH)	650×610×1630 mm
Weight	135 kg
Max. Modules	5 (12.5 KWh)
Color	Black
Work Environment	Temperature: 0°C To 40°C, Relative humidity: 15%--95%
IP Protection Class	IP21



STORION-EMS

EMS

- High Compatibility
 - Able to operate with multiple Inverters, batteries.
- Visualization
 - Can be monitored via online monitoring program and mobile APPs
- Easy Maintenance
 - Both EMS and BMS firmware can be easily updated by a single USB port
 - Can be updated by yourself for free



Status Display



PV generation, external grid power, battery storage and load.

Battery charge, PV generation and load changing curve.

Incomes/ saving details within 24 hours.

STORION-Hybrid Inverter

3KW Inverter

Maximum PV Input Power	4500 W
No. of MPPTs	1
MPPT Voltage Range	120 VDC - 450 VDC
Maximum PV Input Current / Voltage	1 x 18 A / 500 VDC
Battery Nominal Voltage	48 V
Max. Charging Power / Current	1250 W / 25 A
Max. Discharging Power	3000 W
Max. Grid Output Power	3000 W
Max. Grid Output Current	13 A
Grid Output Range	184-265 VAC ;
Euro efficiency	95%
Standards	VDE4105,VDE0126-1-1/A1, AS4777.2/.3,IEC62109-1&- 2,AS3100,IEC62040-1



STORION-Hybrid Inverter

5KW Inverter

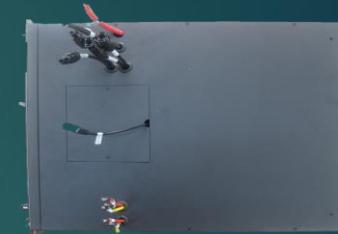
Maximum PV Input Power	5400 W
No. of MPPTs	2
MPPT Voltage Range	125 VDC - 550 VDC
Maximum PV Input Current / Voltage	2 x 15 A / 580 VDC
Battery Nominal Voltage	48 V
Max. Charging Power / Current	2300 W / 50 A
Max. Discharging Power	4600 W
Max. Grid Output Power	4600 W
Max. Grid Output Current	20 A
Grid Output Range	180-270 VAC ;
Euro efficiency	97%
Standards	VDE4105,VDE0126-1-1/A1, AS4777.2/.3,IEC62109-1&- 2,AS3100,IEC62040-1



STORION-Cable Box



Rear Side View



Top View



Side View



Front View

Features:

- Easy Mounting, Safety Enhancement
- Modular Design, Plug-and-Play
- Trouble-free Maintenance

STORION-Battery Modules

M4850

Max. Charge Current	25 A (0.5C)
Max. Discharge Current	25 A (0.5C)
Max. Charge Current (OFF-GRID)	25 A (0.5C)
Max. Discharge Current (OFF-GRID)	50 A (1C)
Max. Discharge Pulse Current (10S)	100 A
Power Consumption	<2 W (Work) <100 mW (Sleep)
Energy Capacity	2.5 kWh
Usable Capacity	2.0 kWh
DOD	80%
Nominal Voltage	51.2
Operating Temperature Range	0°C To 40°C
Internal Resistance	≤100 mΩ
Cycle Life	≥6000 @80%



STORION-Battery Modules

M4860

Max. Charge Current	30 A (0.5C)
Max. Discharge Current	30 A (0.5C)
Max. Charge Current (OFF-GRID)	30 A (0.5C)
Max. Discharge Current (OFF-GRID)	60 A (1C)
Max. Discharge Pulse Current (10S)	100 A
Power Consumption	<2 W (Work) <100 mW (Sleep)
Energy Capacity	3 kWh
Usable Capacity	2.4 kWh
DOD	80%
Nominal Voltage	51.2
Operating Temperature Range	0°C To 40°C
Internal Resistance	≤100 mΩ
Cycle Life	≥6000 @80%



Storion PowerPlug

Cabinet

Outline Dimensions (WxDxH)	600 x 600 x 800 mm
Max. Modules	4 (10KWh)
Color	Black
Work Environment	Temperature: - 40°C To 60°C, Relative humidity: < 95 %
IP Protection Class	IP2(0)
Standards / Certificates	ANSI EIA, RS-310-D, IEC297-2, DIN41491, PART1, DIN41494, PART7, GB / T3047.2-92, 19" International standard Metric standard, ETSI
Safety	<ul style="list-style-type: none"> ① Excellent conductivity and antistatic ability; ② High shock resistance performance
Reliability	<ul style="list-style-type: none"> ① Firm and stable structure ② Cabinet bearing capacity: 800 kg (While still), > 500 kg (While moving) ③ Tray bearing capacity: 50 kg



Our products are:

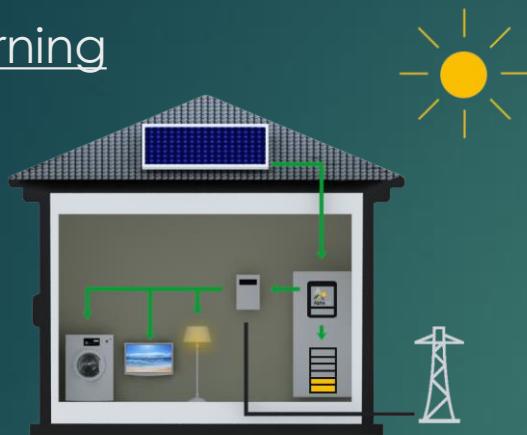
1. Multifunctional
2. Reliable
3. Safe
4. Compatible
5. With Alpha Cloud

Multi-function

- ▶ Maximize PV self-consumption
- ▶ UPS function in case of grid outage
- ▶ Load shifting
- ▶ Demand charge management
- ▶ Load management

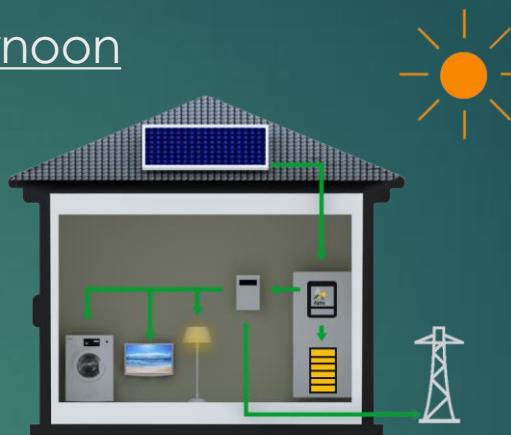
System Operation

Morning



The energy produced by the PV module is used to optimize self-consumption; the surplus energy will be used to recharge the batteries.

Afternoon



When the batteries are fully charged and Alpha system already meets your self-consumption requirements, the surplus energy will be fed into public grid.

Evening



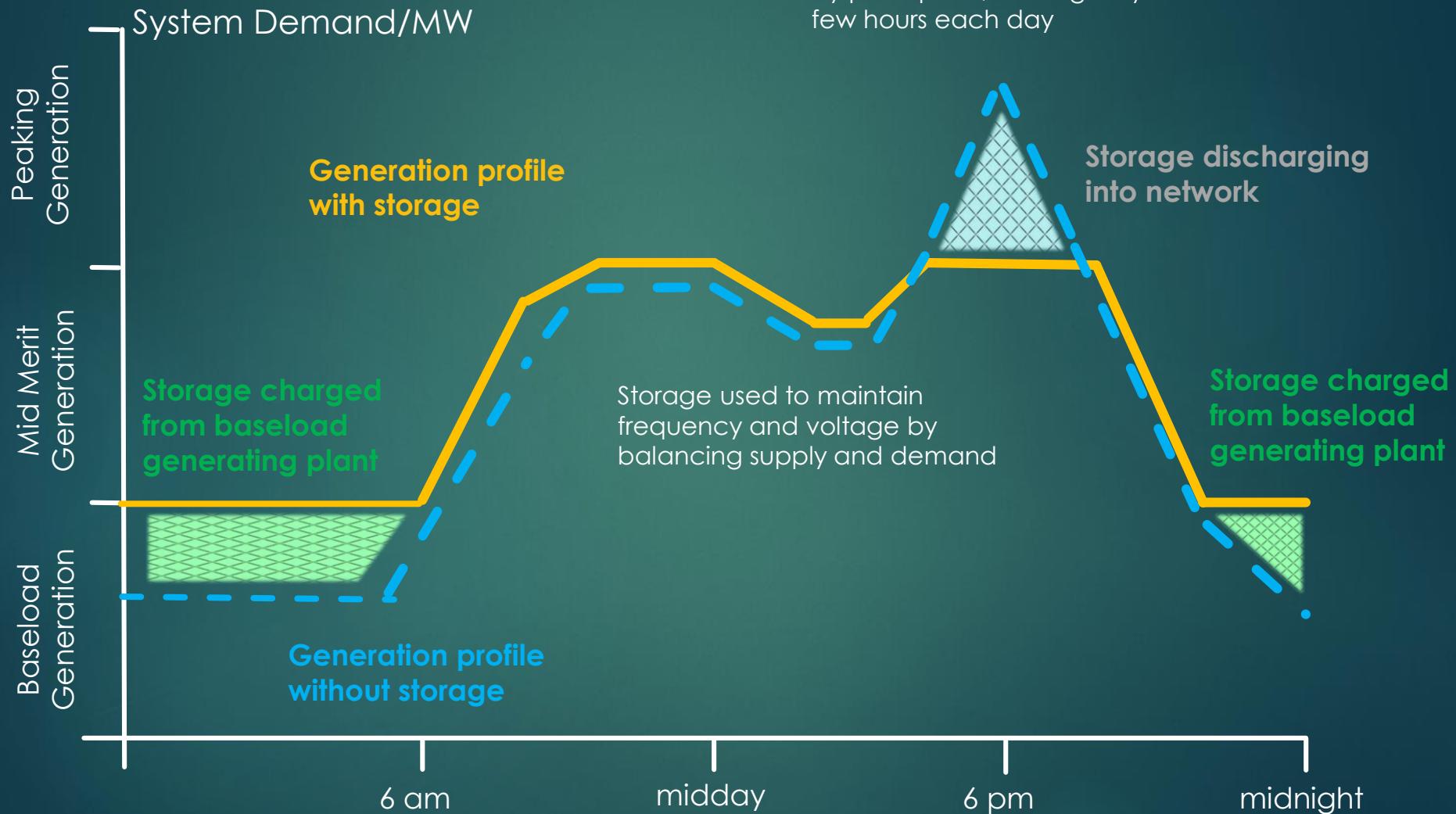
Once the sun sets, Alpha system will automatically switch to battery-stored energy. If the battery capacity or power is insufficient to meet your consumption requirements, electricity will then be obtained from public grid.

UPS

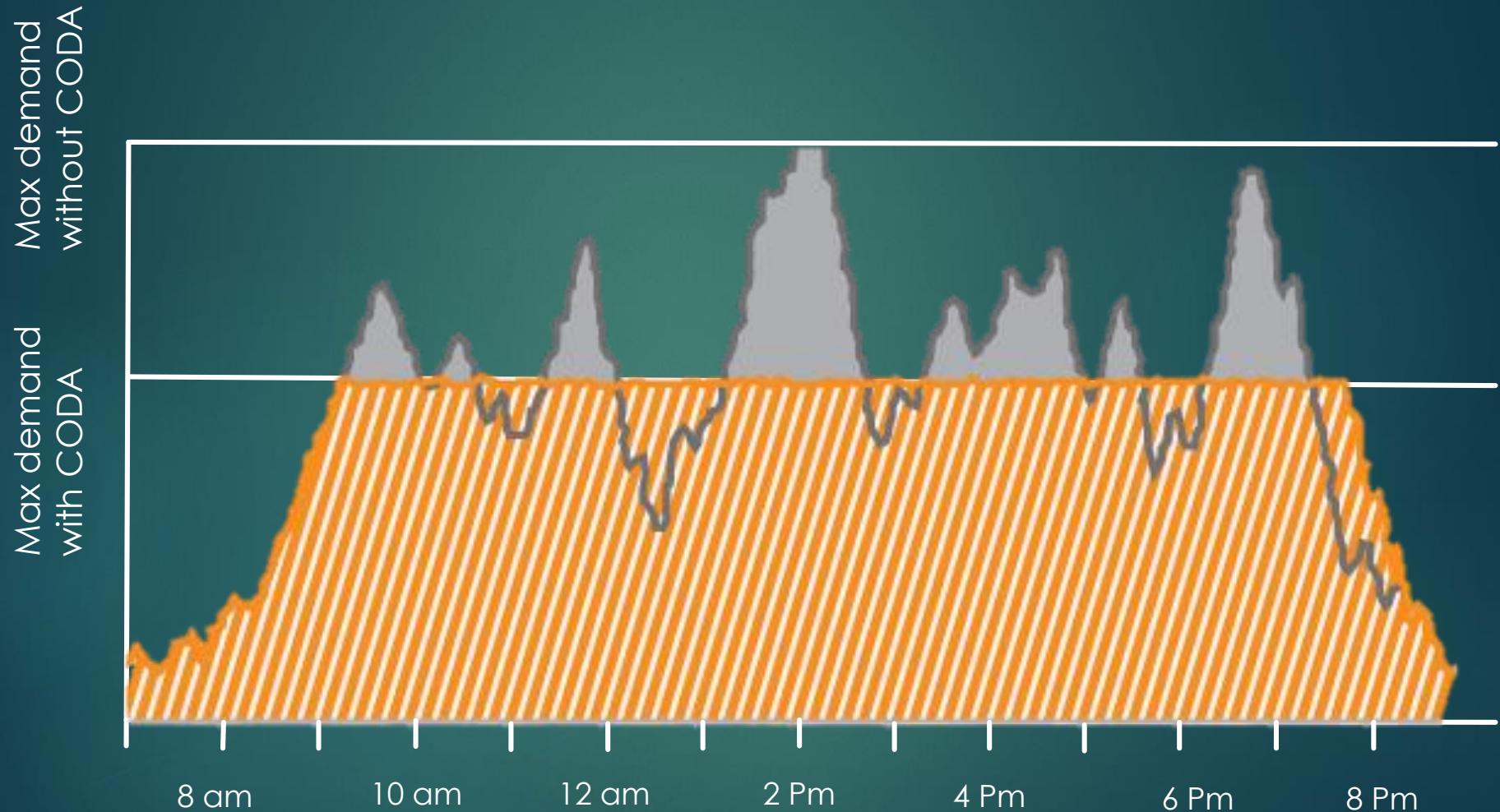


When the grid fails, Alpha system can switch to off-grid mode automatically and supply the loads (**UPS** function)

Load shifting



Demand Charge management



Reliability

- ▶ Battery Selection
- ▶ German design and quality standard
- ▶ 5 years product warranty
- ▶ 10 years battery performance warranty
- ▶ 20 years estimated lifetime

Reliability

Which chemistry should be chosen for household energy storage?

Criteria	Weight
safety	40%
Cost	25%
Cycle Life	25%
Energy Density	10%



Chemistry	Safety (40%)	Cost (25%)	Cycle Life (25%)	Energy Density (10%)	Ratio
LFP	1	0.5	1	0.5	82.50%
LCO	0.3	1	0.3	1	54.50%
NMC	0.5	1	0.6	0.8	68.00%

LiFePO4



Which cell type is best for household energy storage?



Calendar Life:
5 years
Cost: Low

Calendar Life:
3 years
Cost: Medium

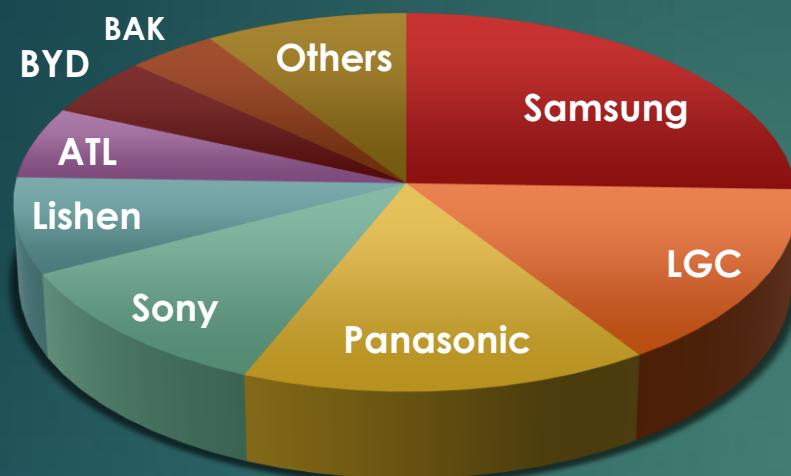
Calendar Life:
5 years
Cost: Medium

Calendar Life:
20 years
Cost: High



The only choice for ESS application

Who do we choose to cooperate?



Cell Type \ Chemistry	LFP	LCO & NMC
Small Cylindrical	SONY 	
Big Polymer Pouch		
Plastic Cells		
Metal CAN Cells	  	



Product Warranty



Battery Performance Warranty



Estimated Life Time

Safety

Safety—Cell level



Safety—Pack level

BMS design:

- 3 levels of software protection
- 2 levels of redundant hardware protection

Certificates



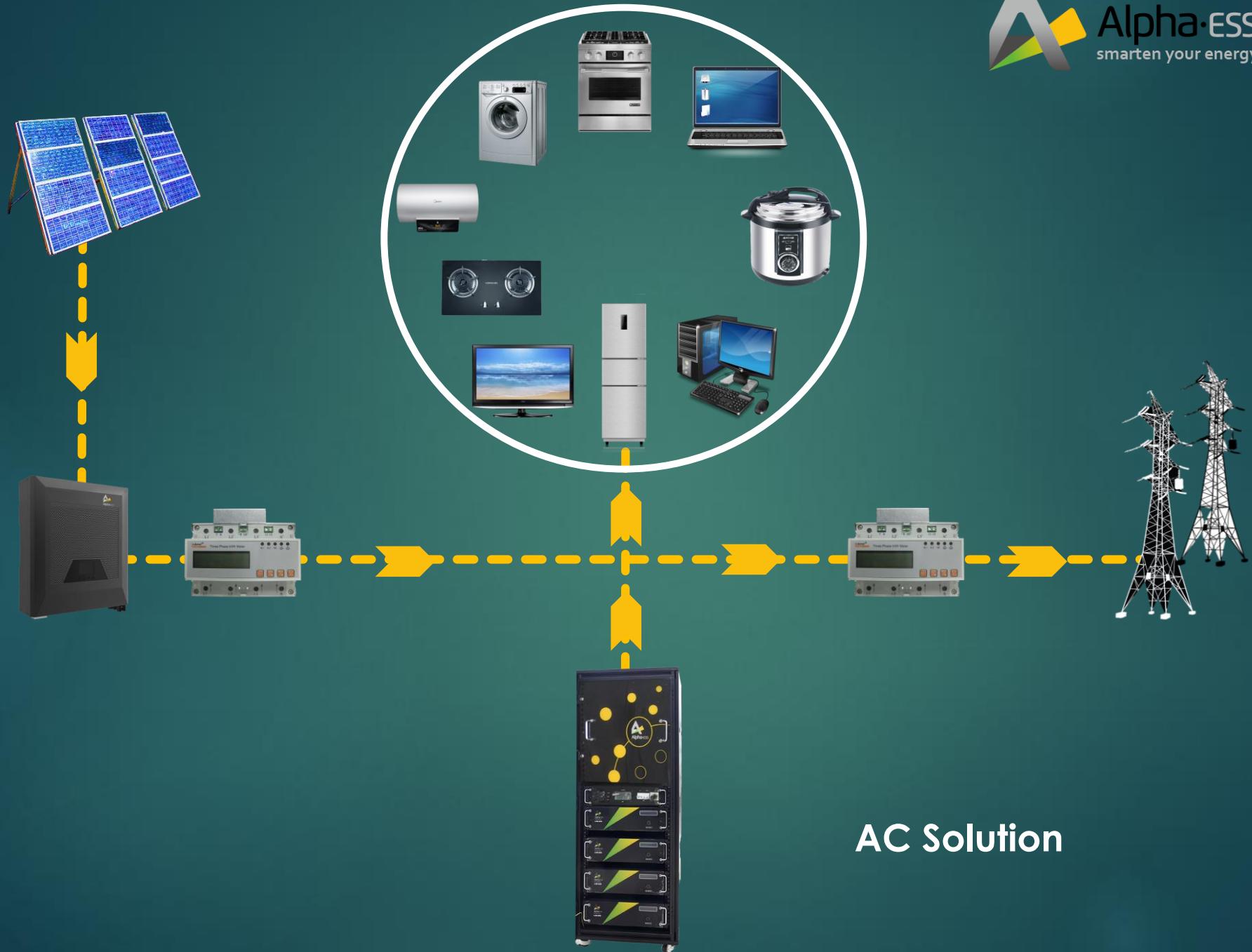
Safety—System level

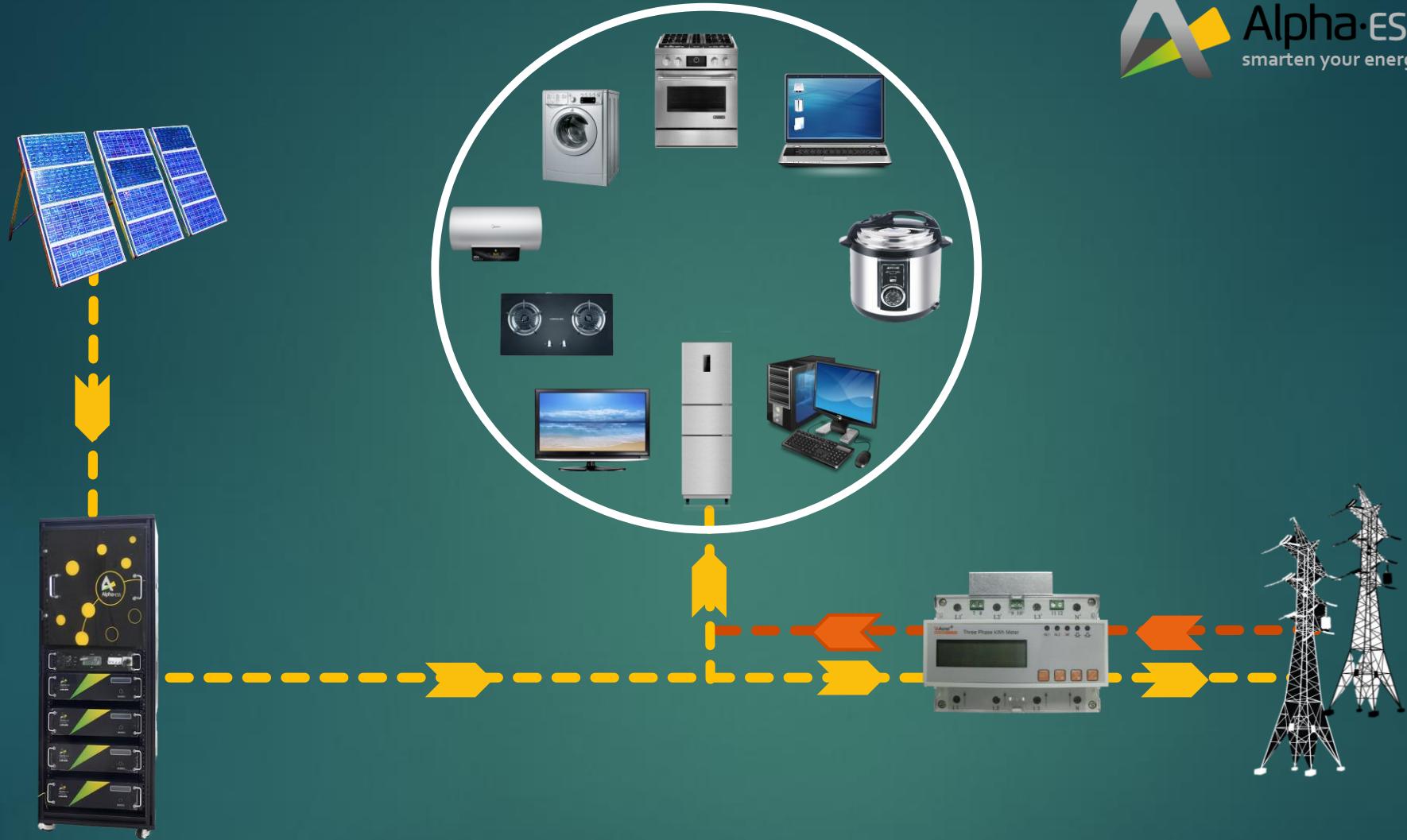
- EMS protection warning
- Online monitoring
- Online service
- Certificates



Compatibility

- ▶ Compatible for both new installation and retrofit systems (both AC/DC coupling)
- ▶ Modular battery, easy to extend
- ▶ Each battery module possesses independent BMS and flexibly operates.





DC Solution

Module Design, Easy to extend



2.5KWh

5KWh

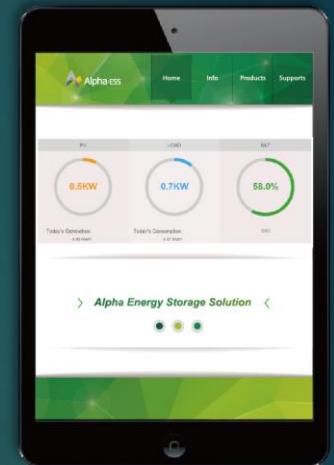
7.5KWh

10KWh

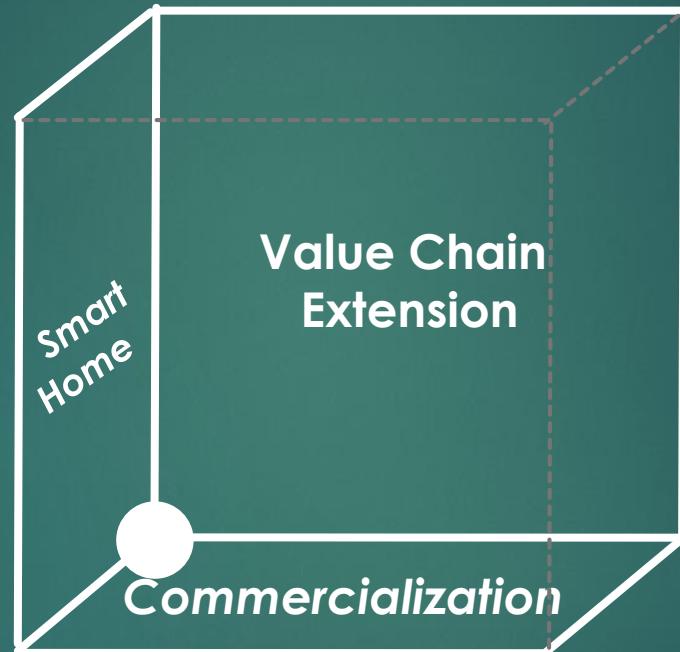
12.5KWh

Service

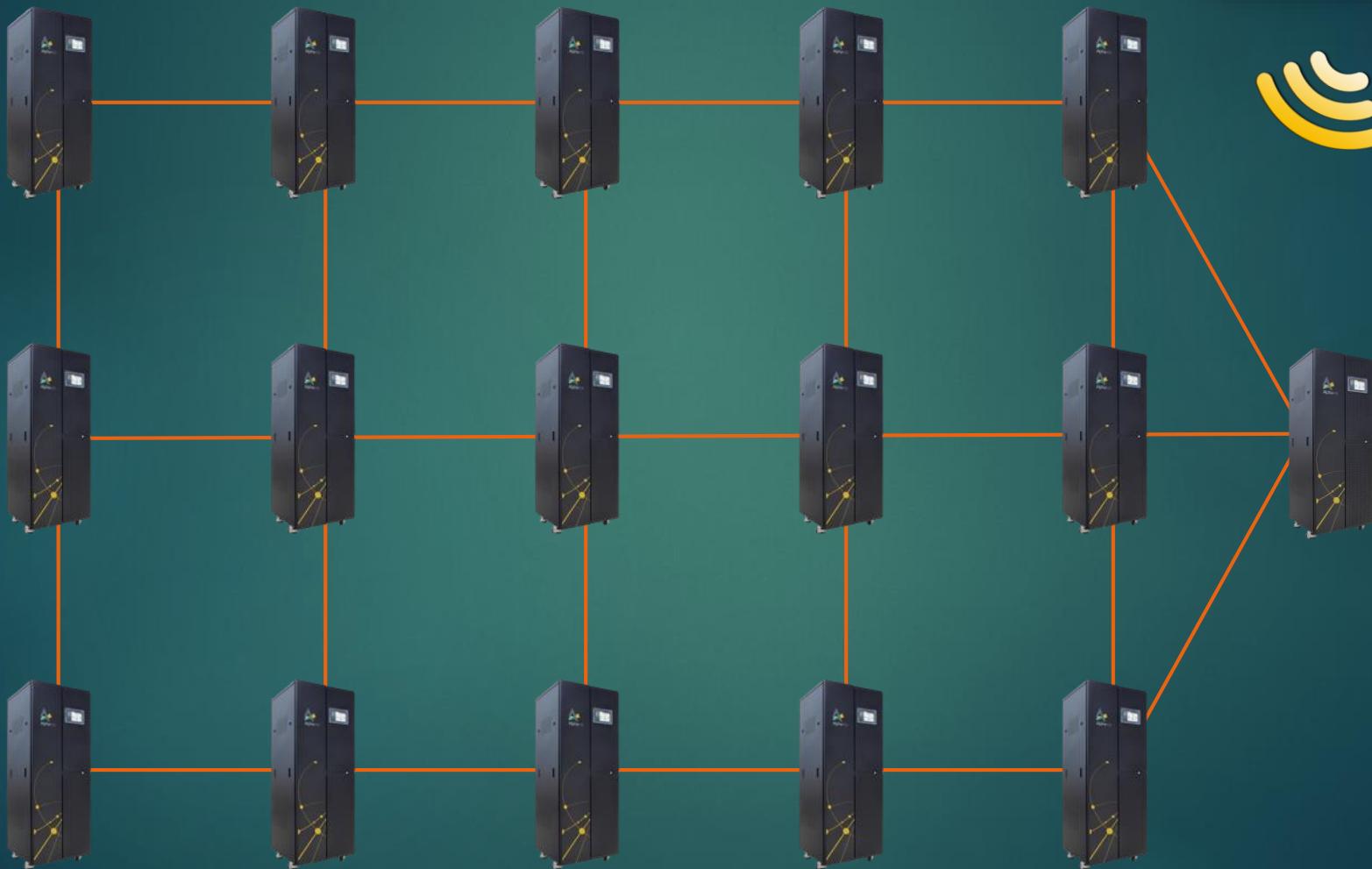
- ▶ Alpha Cloud
- ▶ Free online visualization through friendly user design
- ▶ Easy updating by using standard USB flash/online update
- ▶ Professional technical support from AlphaESS
- ▶ Future access to Energy Internet available



Alpha Road Map



Alpha Road Map



Contact information

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Smarten Your Energy!