

# Company Introduction

ALPHA ENERGY STORAGE SOLUTION CO., LTD.

JUNE, 2015

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# Our Concentration



vs.



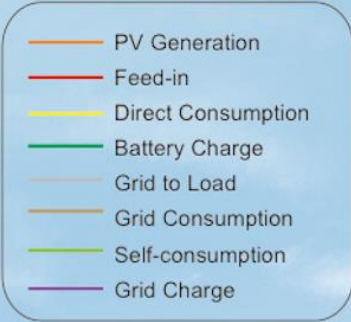
*Without ESS  
PV energy is not  
sustainable.*

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

# *Our Concentration*



AlphaESS provides Energy Storage Solution  
specifically designed for PV market.



**100% 15.08KWH**

**12% 1.75KWH**

**18.63KWH**

**88% 13.33KWH**

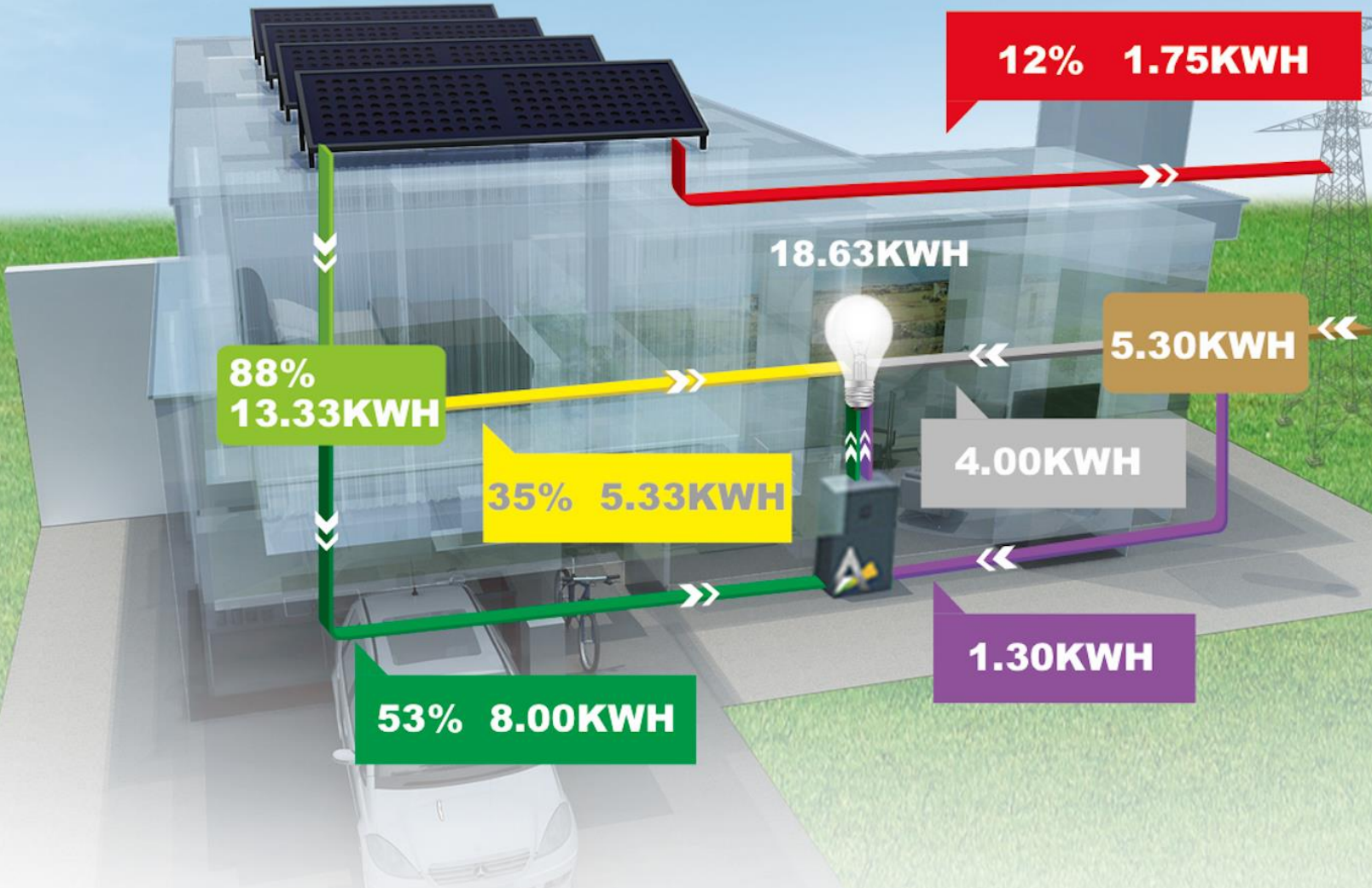
**5.30KWH**

**35% 5.33KWH**

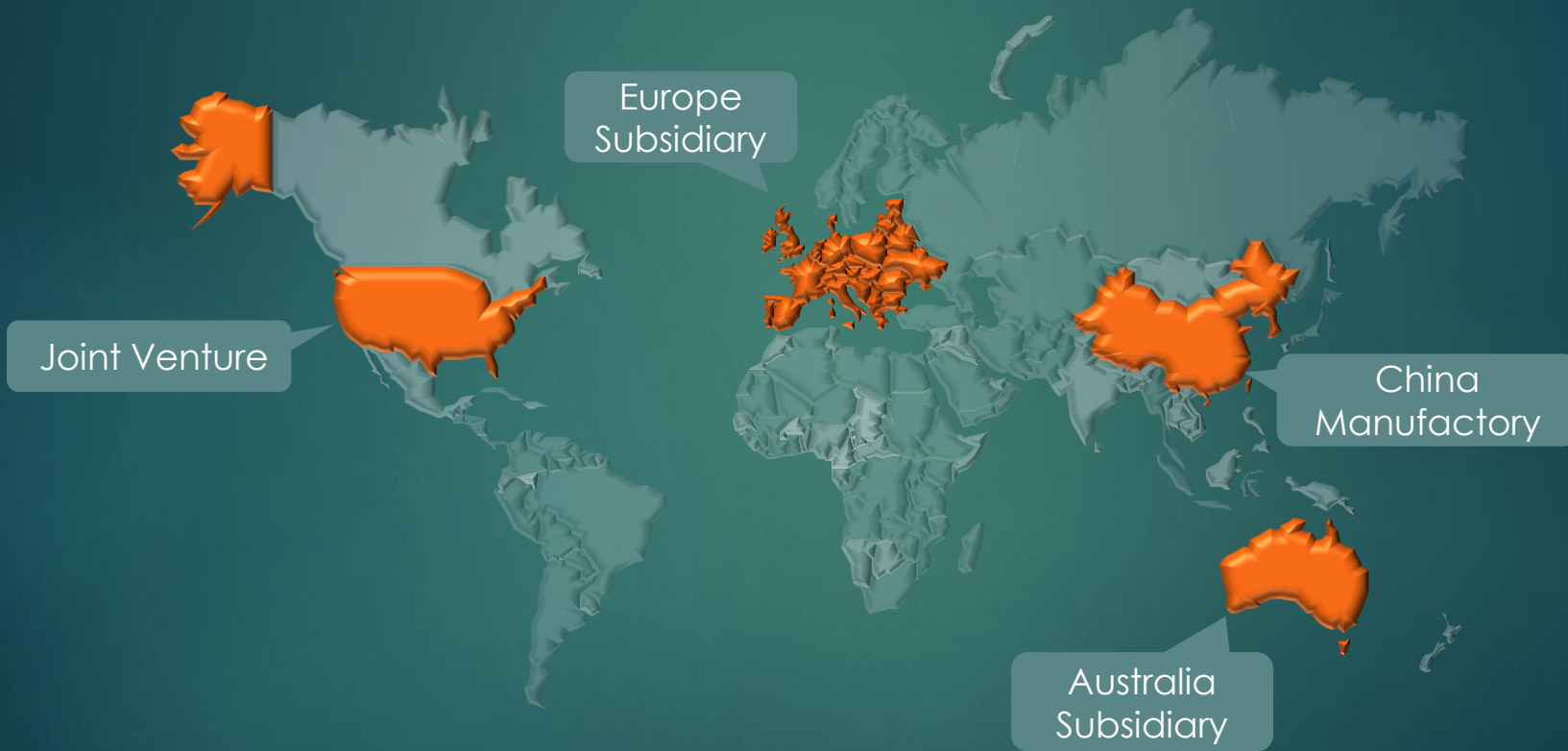
**4.00KWH**

**53% 8.00KWH**

**1.30KWH**



# Our Markets



# Milestones

• Headquarter founded

• EMS



Product

2012

2013

2014

2015

• Sales & Marketing subsidiary founded



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



• Intersolar Exhibition



• AlphaESS-CS001



• Product Family



• Europe Subsidiary



• Australia Subsidiary



• American Market



• 6000m<sup>2</sup> new manufactory

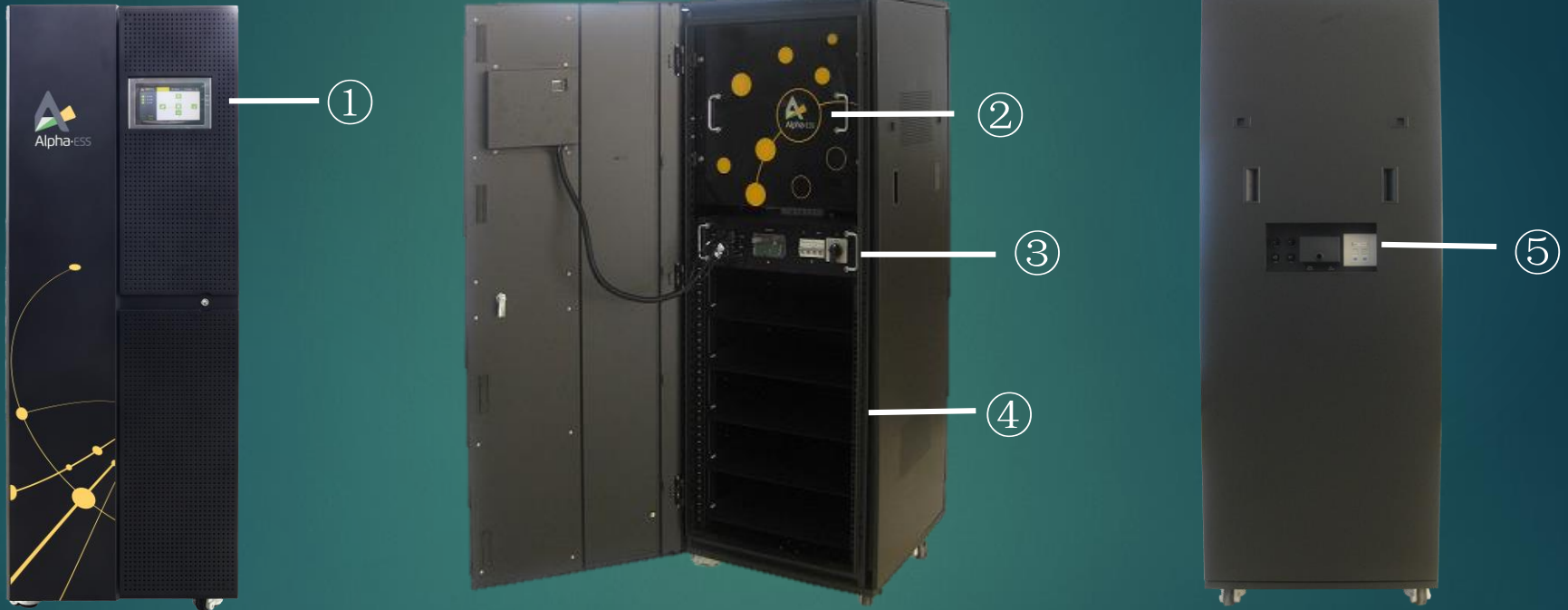


# Products

STORION			Alpha-Centauri		Storion PowerPlug
S3	S5	T6	S3	S5	2.5Kwh x 4
					



# STORION — STORAGE Lithium-ION



① EMS LCD touch panel

② Inverter (behind logo panel)

⑤ Connection ports  
on backside

③ Cable box

④ Battery Module Slots

# 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

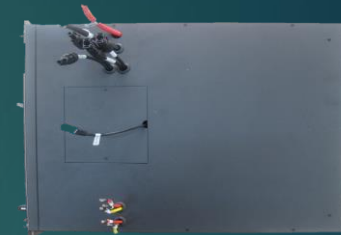
Maximum PV Input Power	5400 W
No. of MPPTs	2
MPPT Voltage Range	125 VDC - 550 VDC
Maximum PV Input Current / Voltage	2 x 15 A / 580 VDC
Battery Nominal Voltage	48 V
Max. Charging Power / Current	2300 W / 50 A
Max. Discharging Power	4600 W
Max. Grid Output Power	4600 W
Max. Grid Output Current	20 A
Grid 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	① Excellent conductivity and antistatic ability; ② High shock resistance performance
Reliability	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:

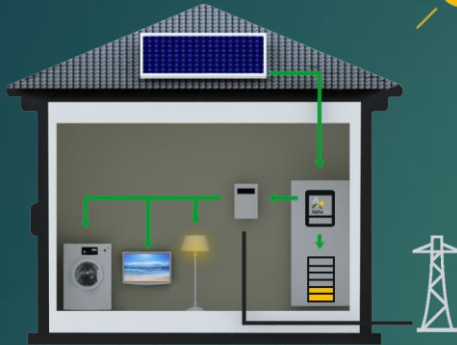
1. Multifunctional
2. Reliable
3. Safe
4. Compatible
5. With Alpha Cloud

# Multi-function

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

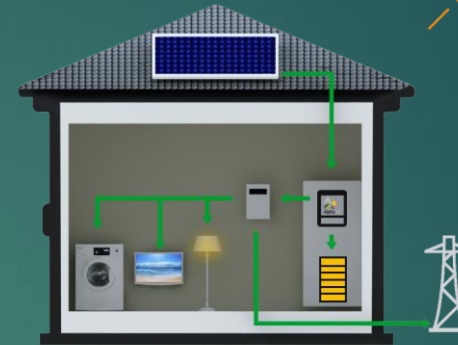
# System Operation

## 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



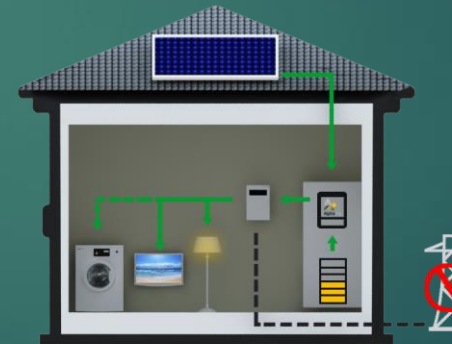
When the batteries are fully charged and Alpha system already meets your self-consumption requirements, the surplus energy will be fed into public grid.

## Evening



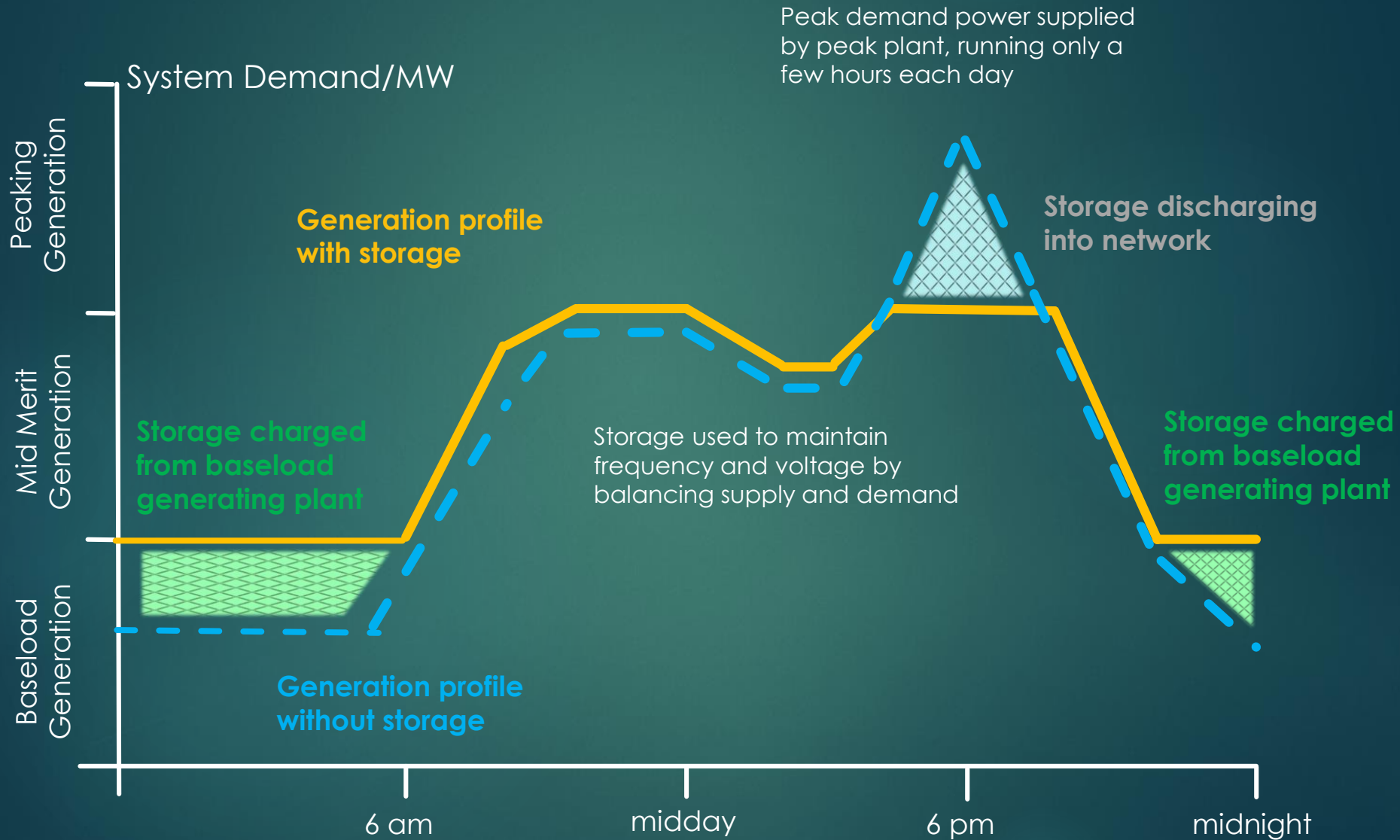
Once the sun sets, Alpha system will automatically switch to battery-stored energy. If the battery capacity or power is insufficient to meet your consumption requirements, electricity will then be obtained from public grid.

## UPS

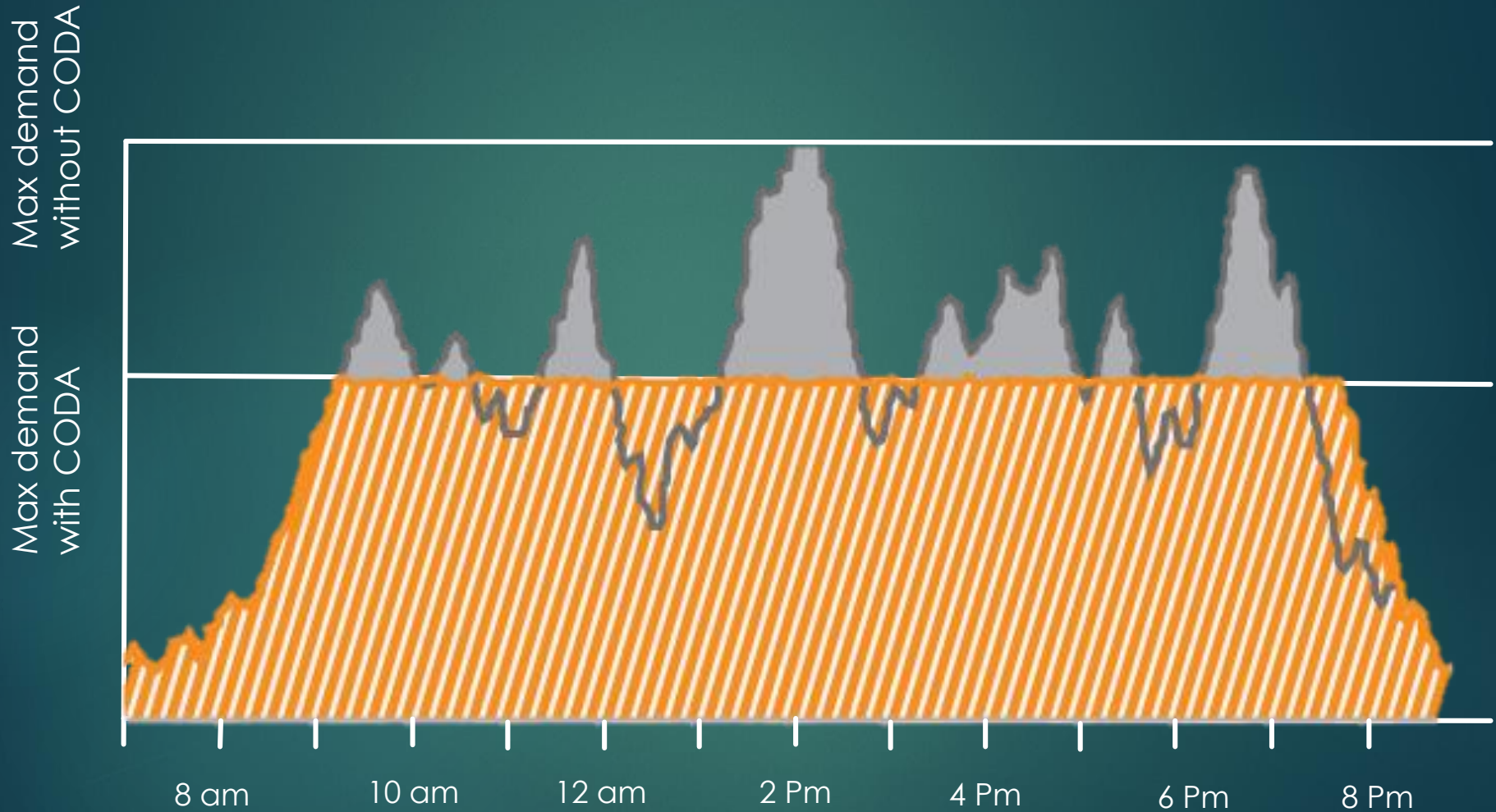


When the grid fails, Alpha system can switch to off-grid mode automatically and supply the loads (UPS function)

# 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



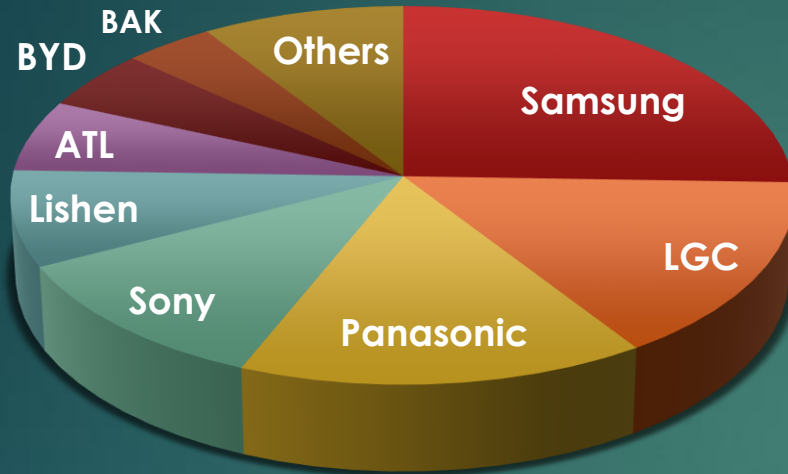
Calendar Life:  
20 years

Cost: High



The only choice for ESS application

# Who do we choose to cooperate?



Chemistry / Cell Type	LFP	LCO & NMC
Small Cylindrical	<b>SONY</b> 	  
Big Polymer Pouch		
Plastic Cells		
Metal CAN Cells	  <b>LISHEN</b>	<b>Panasonic</b>



Product Warranty



Battery Performance Warranty



Estimated Life Time

# Safety

# Safety—Cell level



**Metal Cells**



**Top 5**



**Certificate**



# Safety—Pack level

## BMS design:

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

## Certificates



# Safety—System level

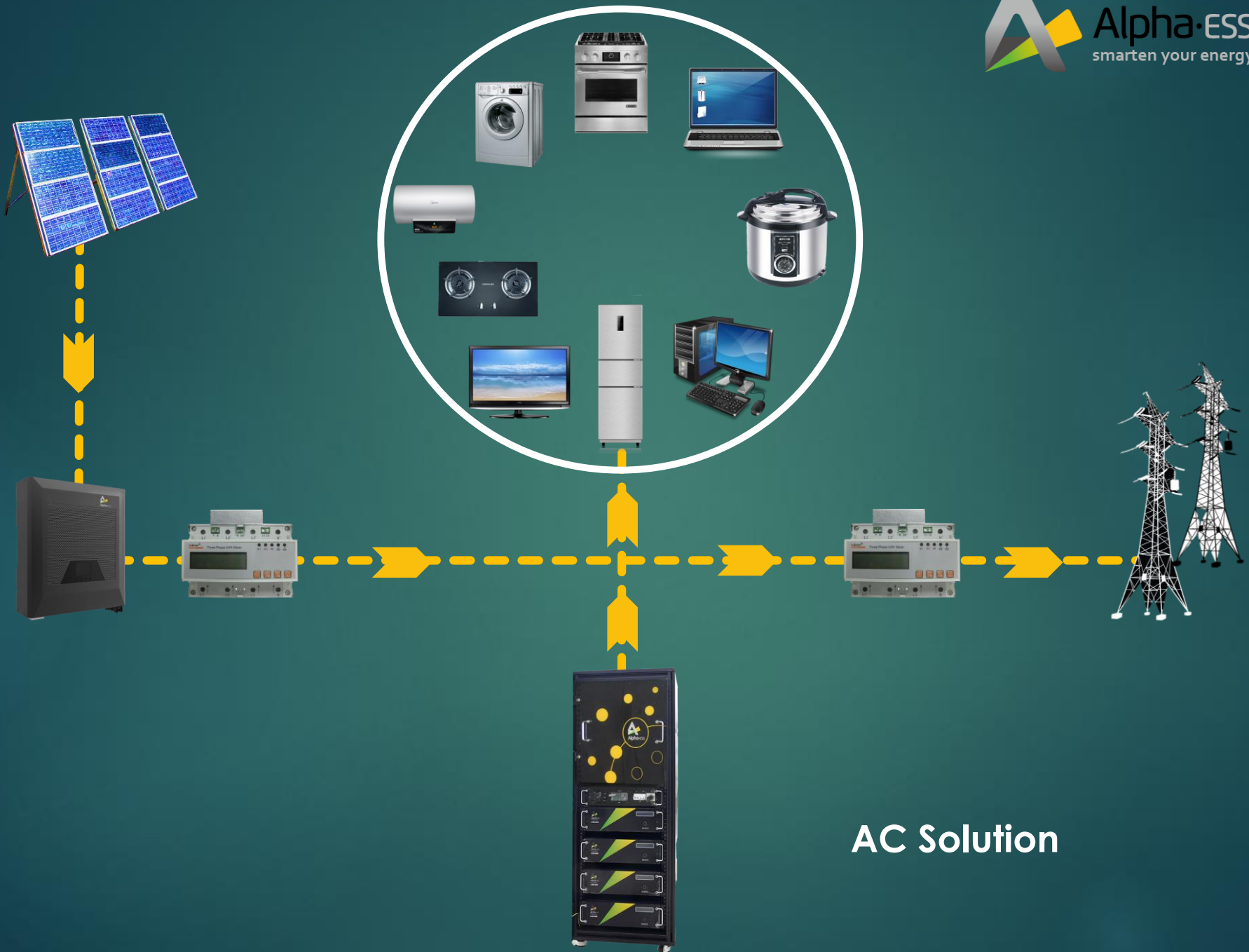
- EMS protection warning
- Online monitoring
- Online service
- Certificates

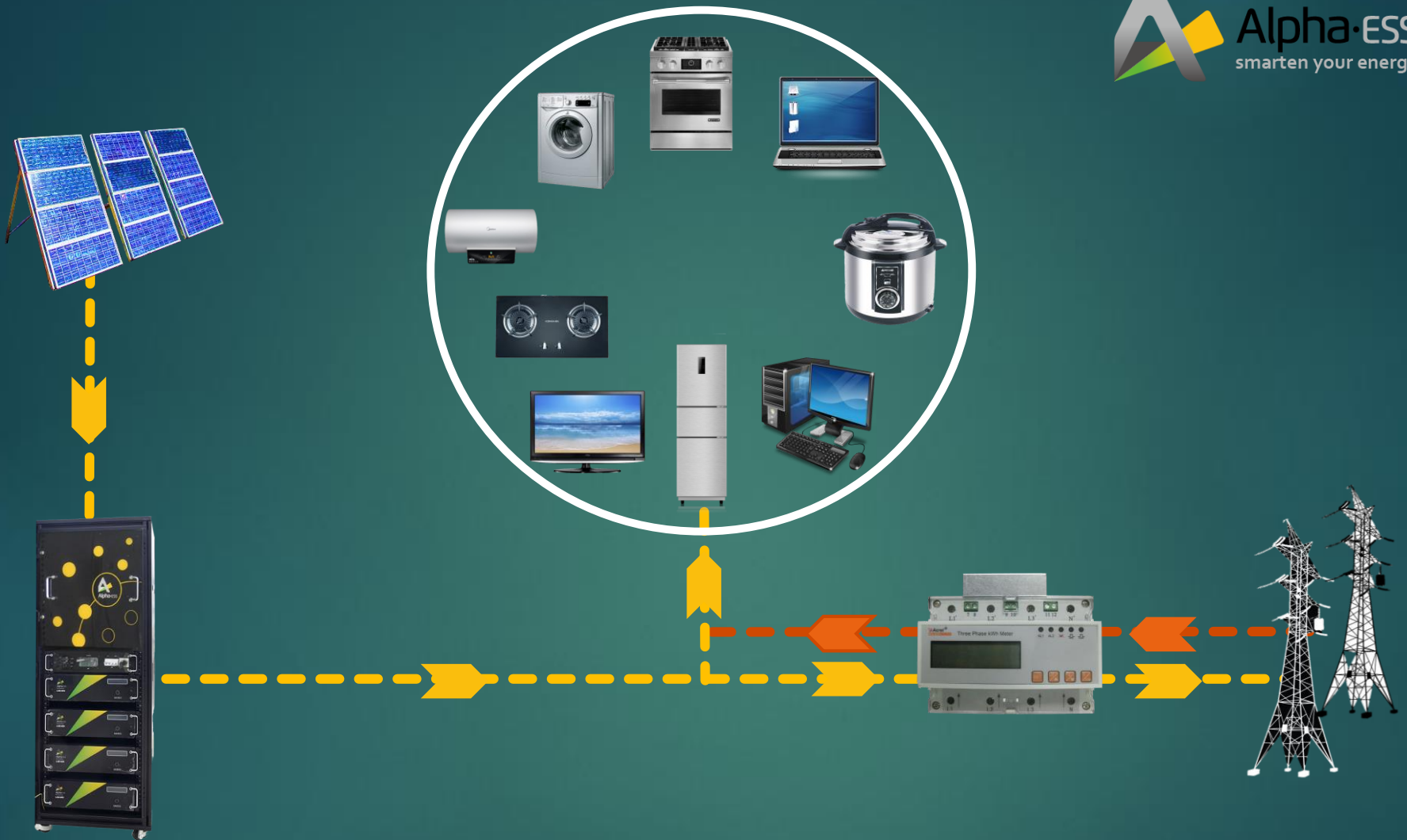


# Compatibility

- ▶ 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**

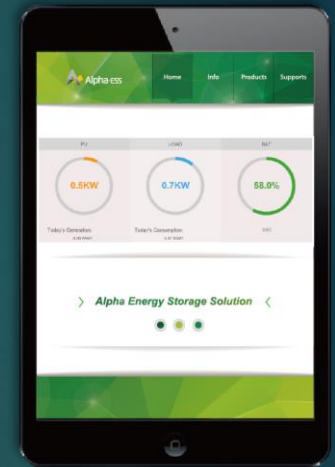
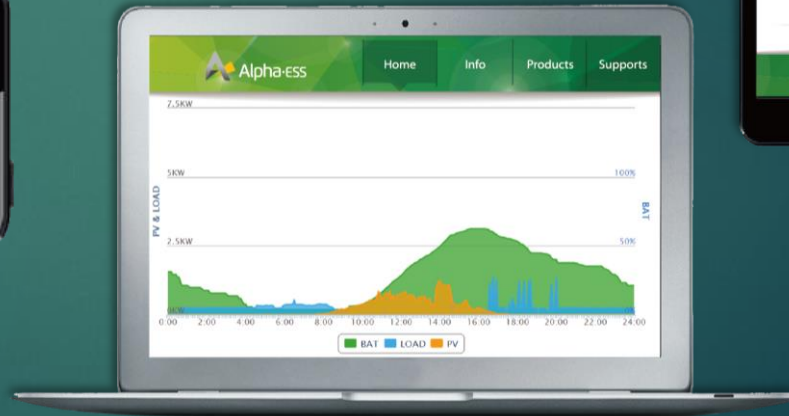
**7.5KWh**

**10KWh**

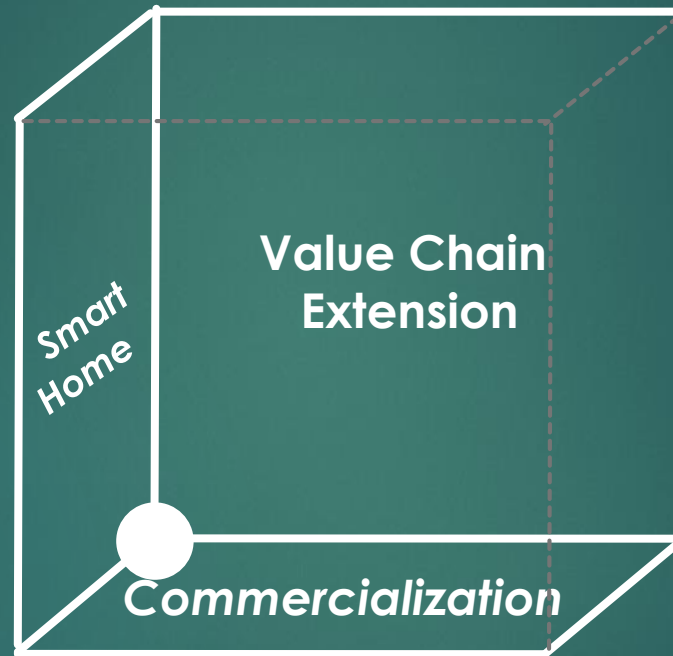
**12.5KWh**

# Service

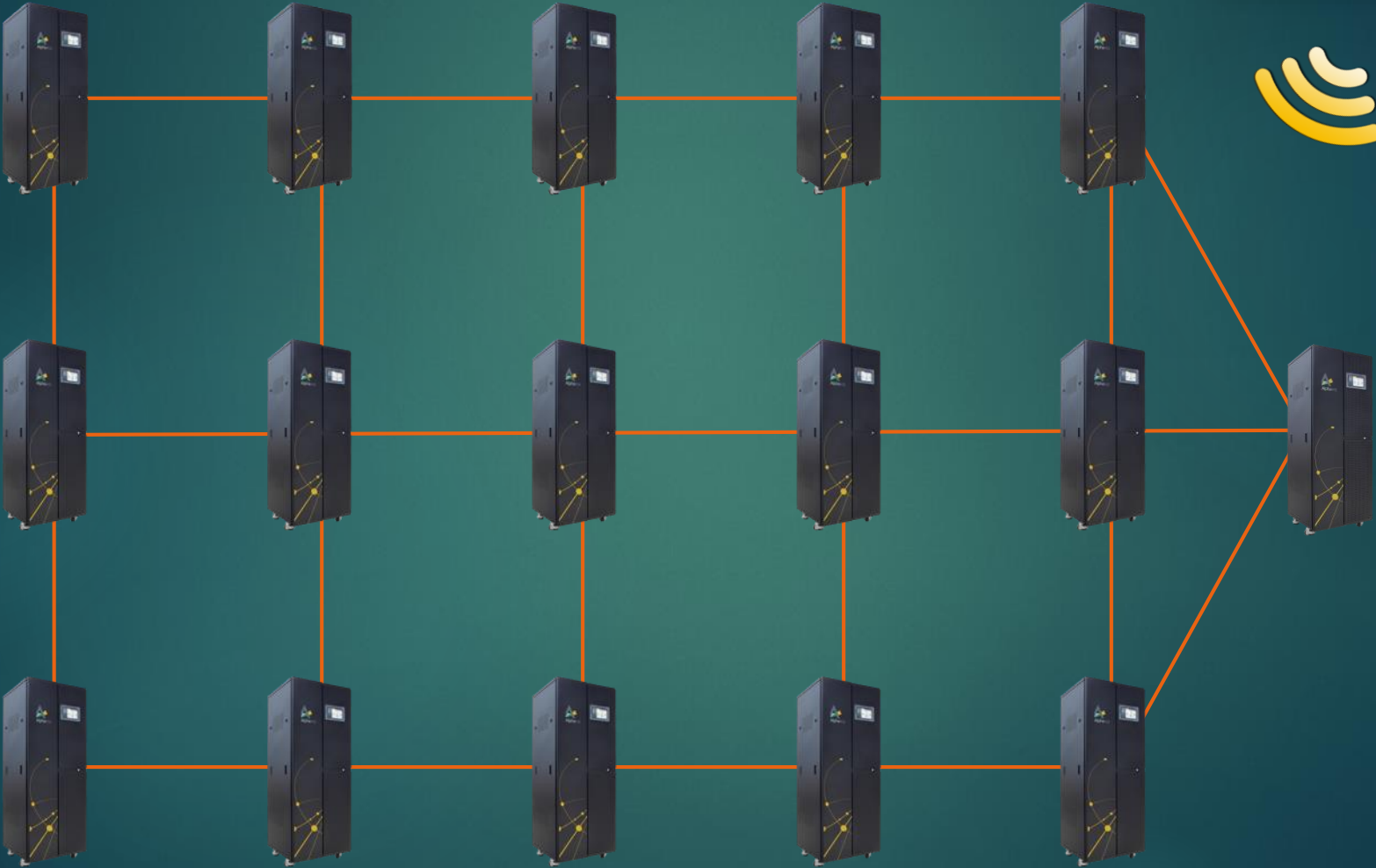
- ▶ Alpha Cloud
- ▶ Free online visualization through friendly user design
- ▶ Easy updating by using standard USB flash/online update
- ▶ Professional technical support from AlphaESS
- ▶ Future access to Energy Internet available



# Alpha Road Map



# Alpha Road Map



# Contact information

## China:

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www.alpha-ess.de

**Add.** Paul-Ehrlich-Straße 1a, 63225 Langen

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**Tel.** +61-(0)412 953 647

www.alpha-ess.com.au

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# Smarten Your Energy!