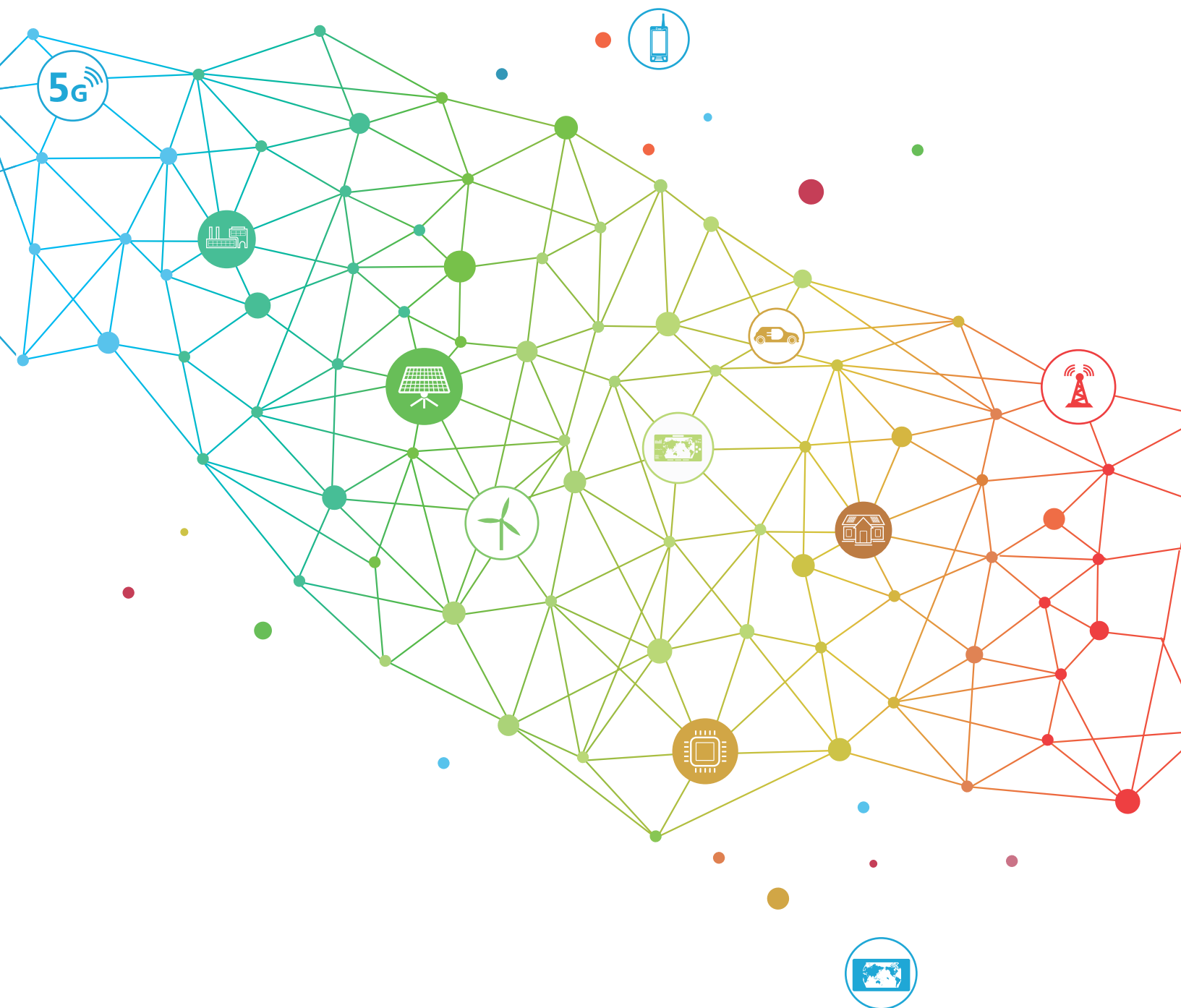


Smarter Energy for a Better Life



Huawei FusionHome Smart Energy Solution



For Installers

Company Introduction



No.70
Interbrand's Top 100
Best Global Brands

180,000
Employees

15
R&D institute and
centers

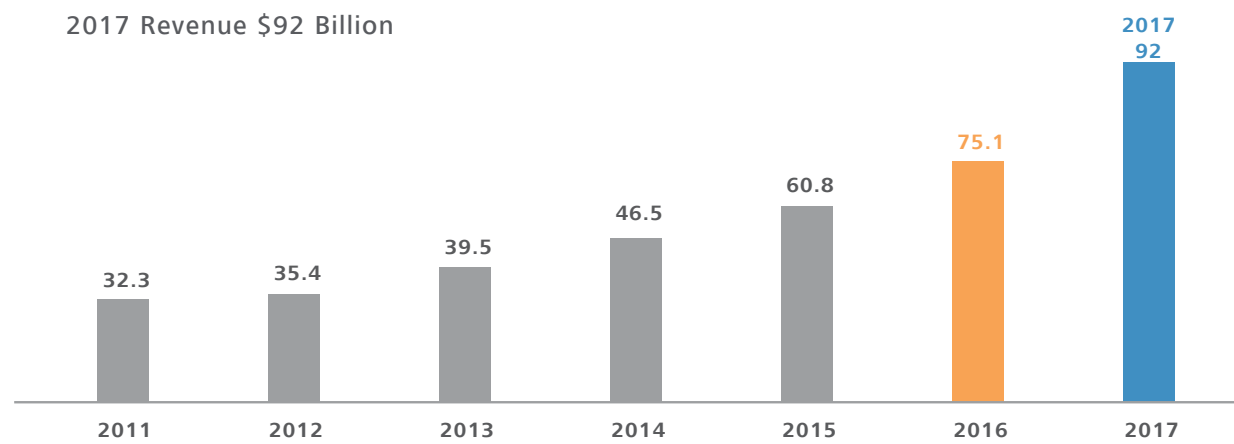
No.83
Fortune Global 500

170+
Countries

80,000
R&D employees

📈 Sustainable, Robust Growth

2017 Revenue \$92 Billion

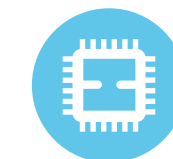


⚙️ Smart PV Solution Achievements

NO.1 Global inverter shipment
in 2015 & 2016

65+ GW Accumulated global
deployment as of Aug, 2017

⚙️ Innovative Technologies



Hisilicon chipset



Power line communication



Big data analytics



Cloud computing

📊 Continuous Strong Investment in Innovation

>\$45
Billion

Accumulated R&D
investment in 2007-2016

\$10.99
Billion

Total R&D
investment in 2016

62,519
Patents

Total patents granted
as of 31st Dec, 2016

👥 Winning Consumer Loyalty and Building Brand Influence



Serving Over 1/3 of the
World's Population

No.3

Global Smartphone Retail
Market Share

81%

Increasing Global
Brand Awareness

🔧 Full Lifecycle Service Guarantee

★ TAC (Technical Assistance Centers)

◆ Logistic Center

● Training Center

● Local Spare Parts Center

● Central Spare Parts Center



FusionHome Smart Energy Solution Overview

Huawei integrates the latest digital and internet technology with residential solar technology, bringing you optimized PV power generation, built-in plug & play battery interface and smart home energy management, achieving customer value of "higher revenue", "simple & easy", "safe & reliable" and "smart management", delivering a better life experience.



Smart PV Optimizer

- Max. efficiency 99.5%
- Maximize energy yields of each module
- Module-level monitoring & management



Smart Energy Center

- Max. efficiency 98.6%
- 2 MPPTs, one string per MPPT
- Ultra compact, 10.6KG
- Built-in DC coupling battery interface



FusionHome-NetEco1000s Management System

- Querying PV system information anytime, anywhere over the APP
- Visualized remote real-time management, improving O&M efficiency



*Smart Home Hub

- FusionHome combines smart PV solution with smart home management
- Achieves a smart remote control of household appliance

* Provided by 3rd party partners



Smart PV Safety Box

- Enables power line communication with optimizers
- DC disconnection & module-level voltage rapid shutdown

* Available in Q1, 2018

Energy Storage Interface

- Integrates energy storage interface for easier future expansion and higher self-consumption rate

Values for End Users



A Trustworthy Brand



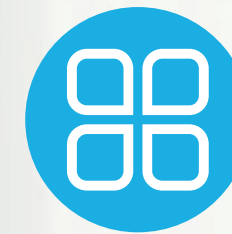
Higher Revenue



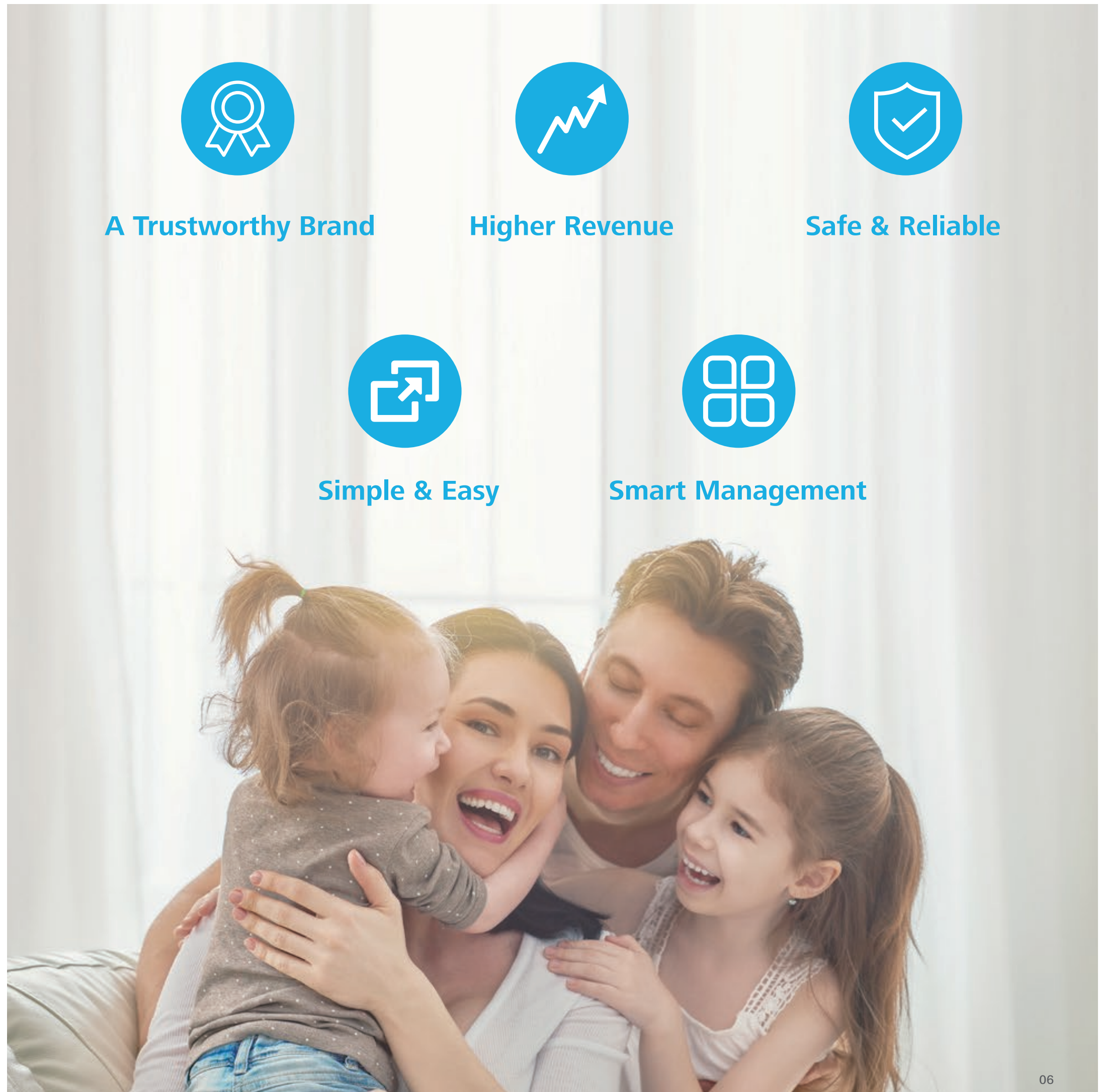
Safe & Reliable



Simple & Easy



Smart Management



A Trustworthy Brand



No.1

Global PV Inverter Shipment

No.83

Fortune Global 500



No.70, 2017 Top 100 Best Global Brands (by Interbrand)



No.49, 2017 BrandZ Top 100 Most Valuable Global Brands



No.10 on the 50 Smartest Companies 2016 ranking of MIT Technology Review

Higher Revenue

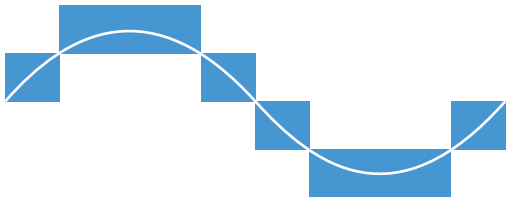


Smart Energy Center, ultimate efficiency for higher yields

• Huawei 5-level inverter topology leads to outstanding efficiency & power quality.



Max. efficiency **98.6%**
Euro. Efficiency **98.0%**

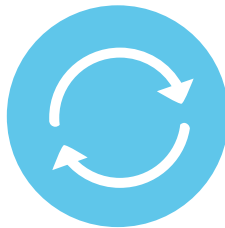


Higher revenue in 25 years



Higher Yields

Higher efficiency, increasing power generation by over 1%.



25 Years' Reliability

High product reliability, less maintenance cost



Higher Revenue

Higher power generation leads to higher revenue in 25 years.

Higher Revenue



Conventional Solution



Conventional solutions are unable to fully utilize the rooftops to maximize yields

Achieve higher yields by installing more panels in the shadow

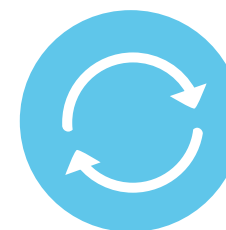


Install More, Achieve More

Generating 22,400~33,600 kWh additional yields in 25 years.

$280/1000 \text{ kWp} * 4 \text{ modules} * (1000 \sim 1500) \text{ h} * 25 \text{ years} * 0.8$

* 0.8 is the shadow factor



25 Years' Reliability

High product reliability, less maintenance cost



1,480~6,224 Euros Net Income

Achieving additional revenue 1,480~6,224 Euros.

$(22,400 \sim 33,600) \text{ kWh} * (0.1 \sim 0.2) \text{ Euros/kWh}$
 $- 4 \text{ modules} * 280 \text{ Wp} * (0.3 \sim 0.5) \text{ Euros/Wp} - 4 \text{ optimizers} * (40 \sim 50) \text{ Euros}$

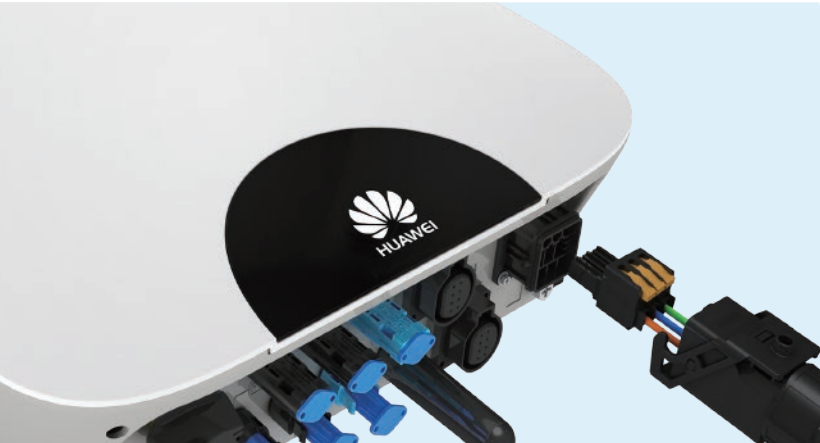
* For reference only, the calculation is based on specific model, electricity price and incentive policy.

FusionHome Solution

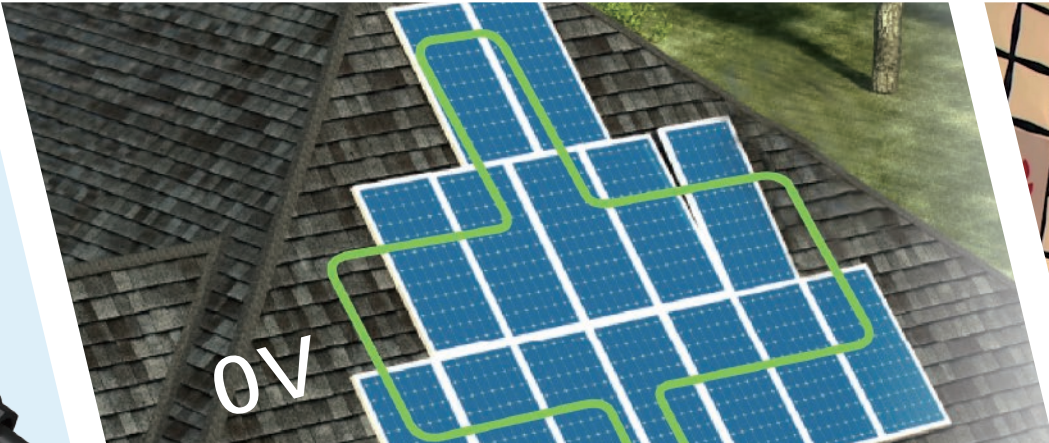


A flexible system design with optimizers, allowing more panels to be installed

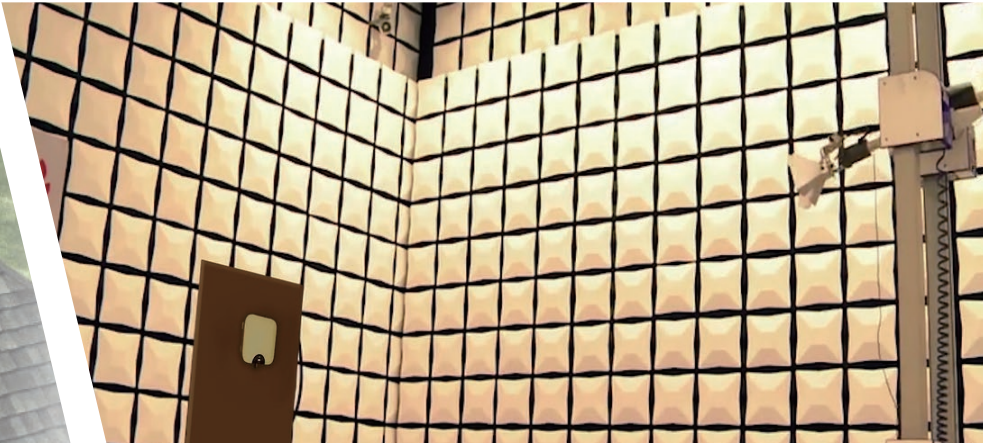
Outstanding safety features & rigorous industry standard testing to secure human & assets safety



Customized AC connector for higher wiring reliability



*Supports quick shutdown of rooftop DC voltage to ensure personnel safety



Meeting requirements with electromagnetic compatibility (EMC) in Huawei Global Compliance Testing Center



Anti-explosion testing for higher safety



Lightning testing for higher reliability

* This function requires full optimizer solution & Smart PV Safety Box, available in Q1,2018

A hand holding a smartphone with a blue screen displaying a circular icon with the letters 'AI'. The phone is connected by white lines to a network of 14 circular icons, each representing a different technology or industry: a factory, a satellite, a server, a washing machine, a camera, a thermometer, a robotic arm, a car, a train, a mobile phone, a person, a surveillance camera, an airplane, and a power line. The background is a light gray with soft, out-of-focus blue and white circles.

Visualize the management of each PV module. Precise faults locating and easy one-click feedback



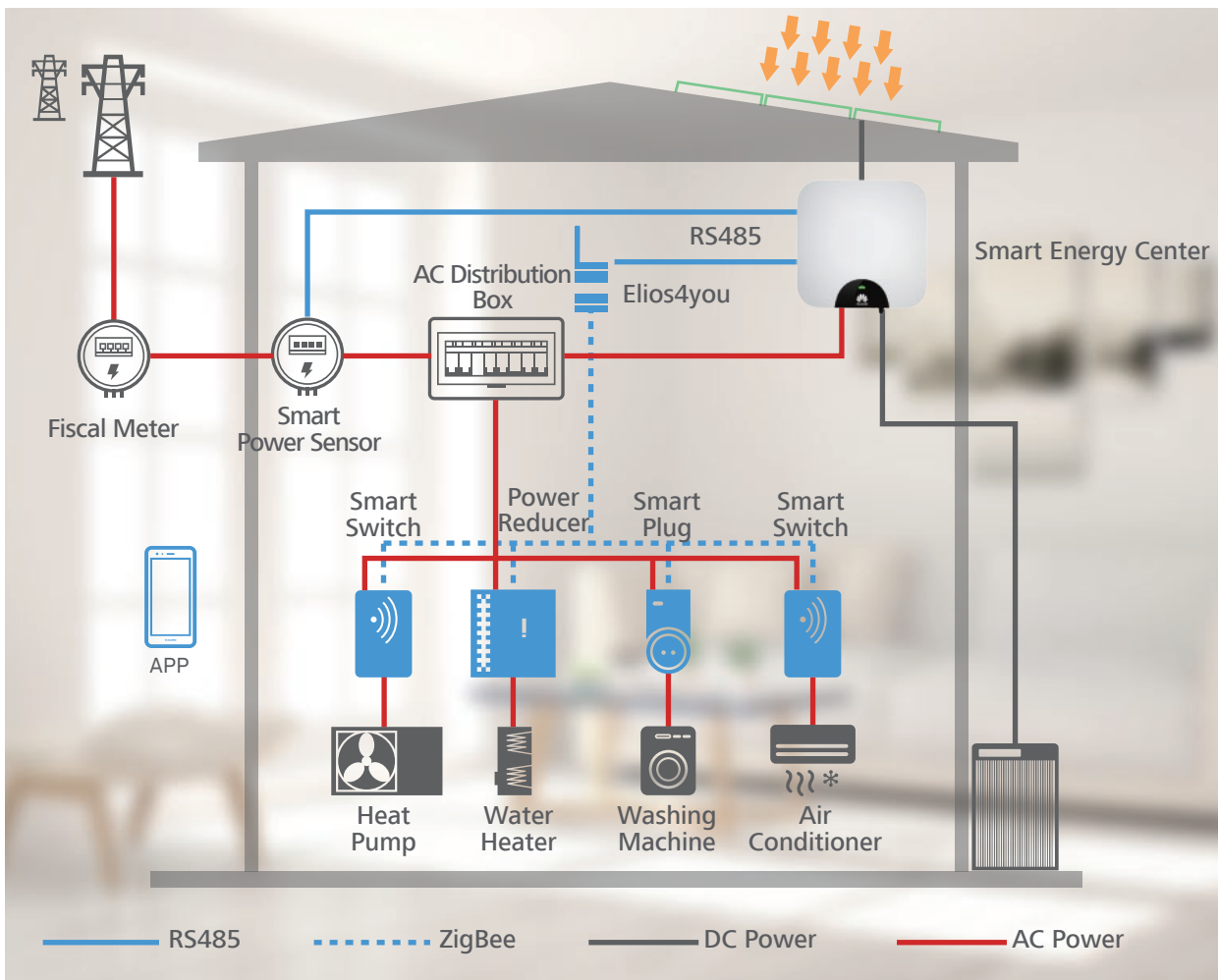
* This function requires full optimizer solution & Smart PV Safety Box, available in Q1,2018

Smart Management

Built-in simple “Plug & Play” energy storage interface, higher solar energy self-consumption rate and battery charging efficiency



Integrate Smart PV and Smart Home to realize the integrated management of energy generation, storage and consumption, increasing solar self-consumption to 80~85%



* Devices marked in blue are provided by 3rd party partners



One-fits-all Solution



**Flexible Design &
Easy Installation**



**One Click Startup &
Better WLAN Connection**



Smart Management



**Full Lifecycle Service
Guarantee**

Values for Installers



One-fits-all Solution



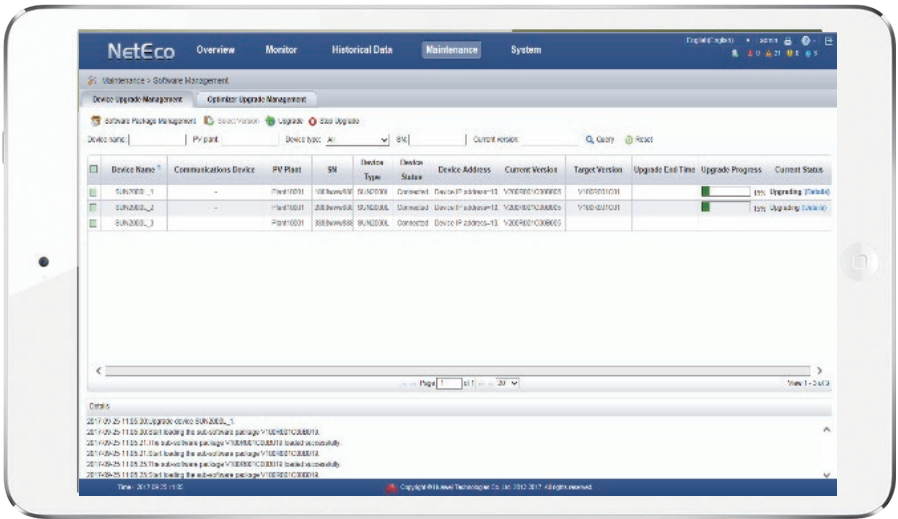
Flat rooftop that only requires a basic system



Complex rooftop with partial shading



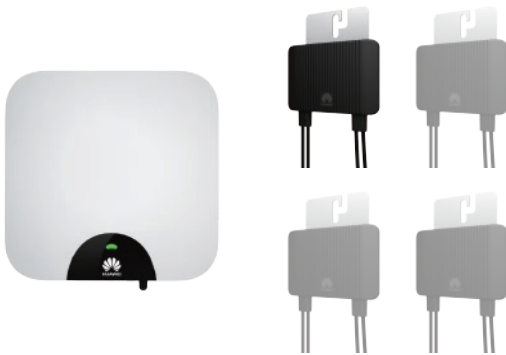
Require higher safety & module management



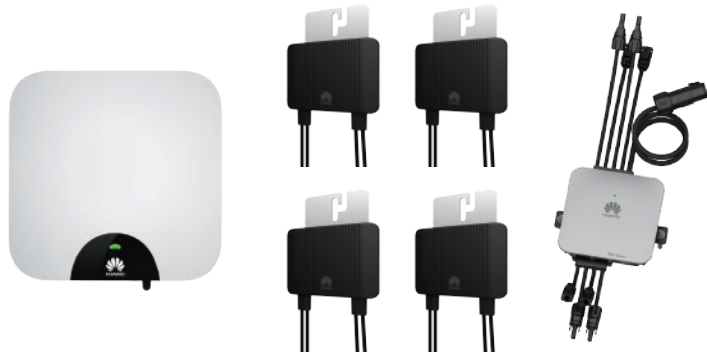
Basic Solution



Partial Optimizer Solution



Full Optimizer Solution



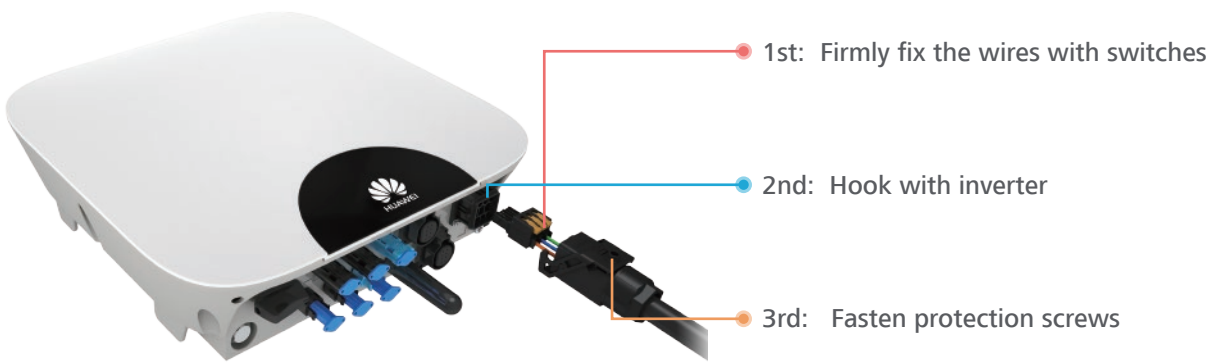
Flexible Design & Easy Installation



Flexible design allowing larger systems to be installed

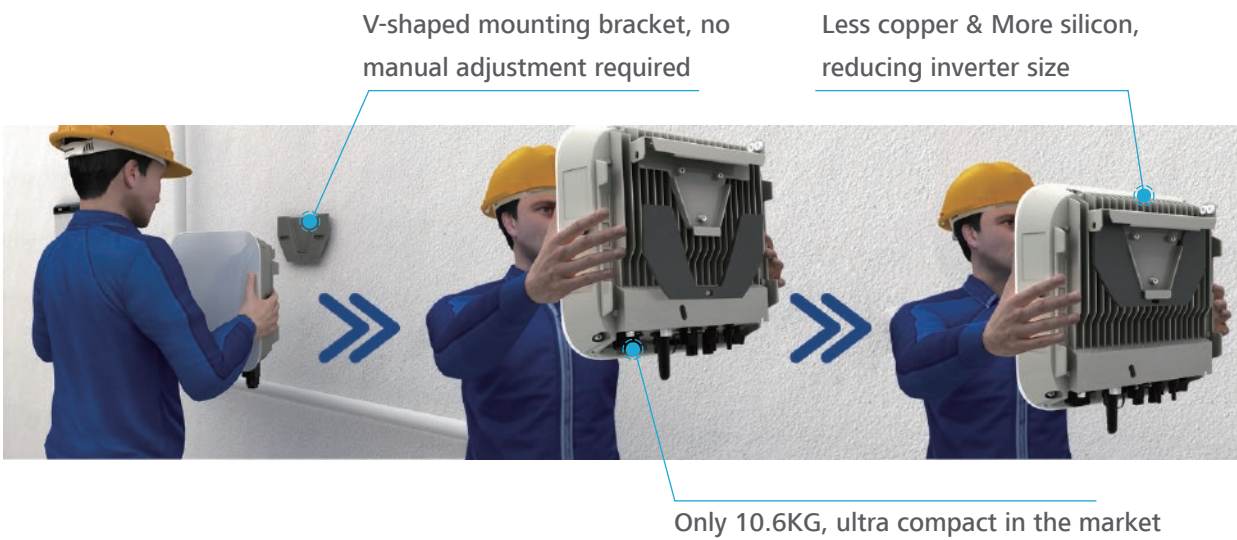


30 seconds quick wiring with customized AC connector



- Standardized connector installation, to ensure long-term reliability

Smaller size enables one person easy installation

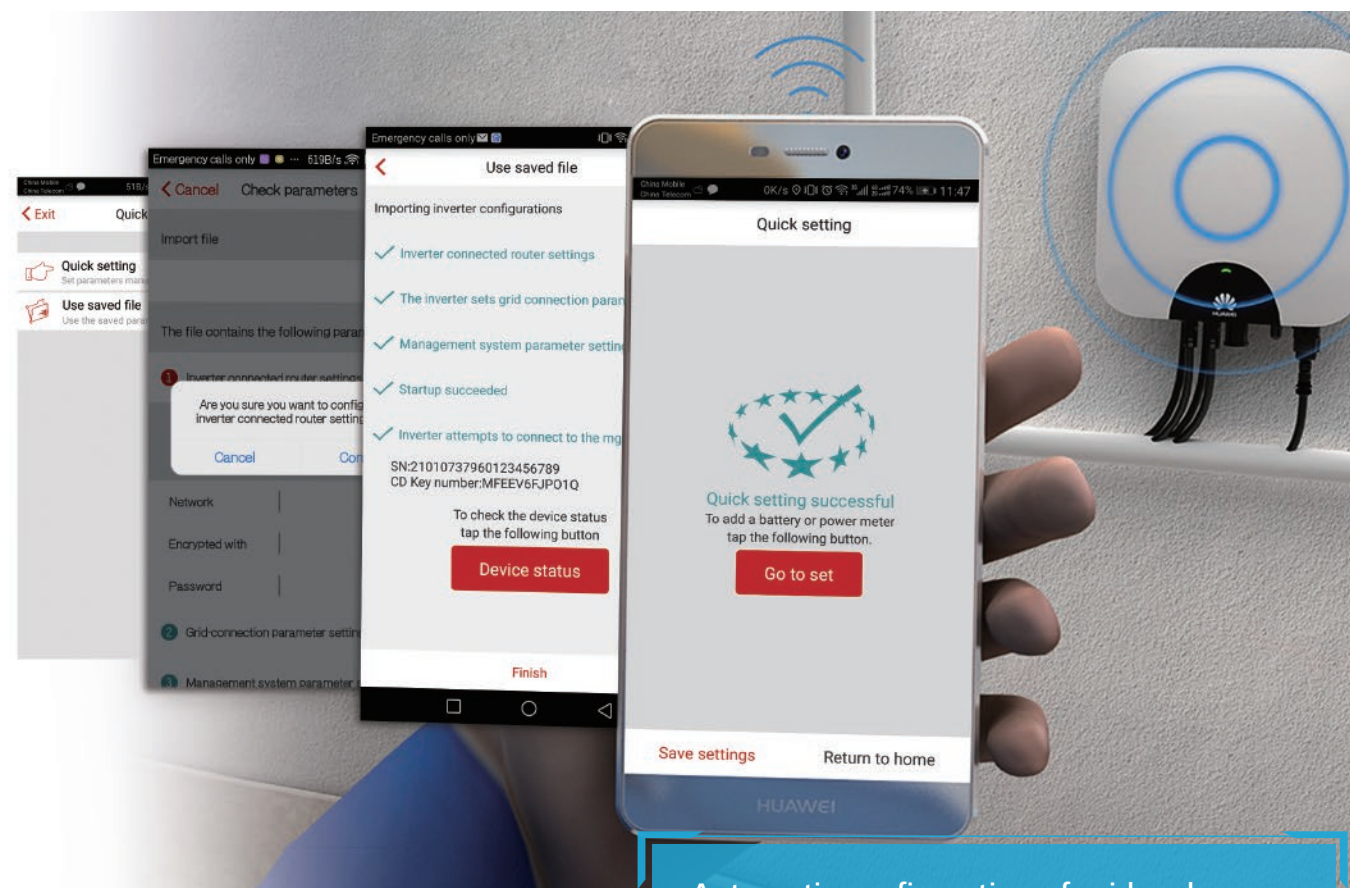


20 seconds optimizer module frame mounting



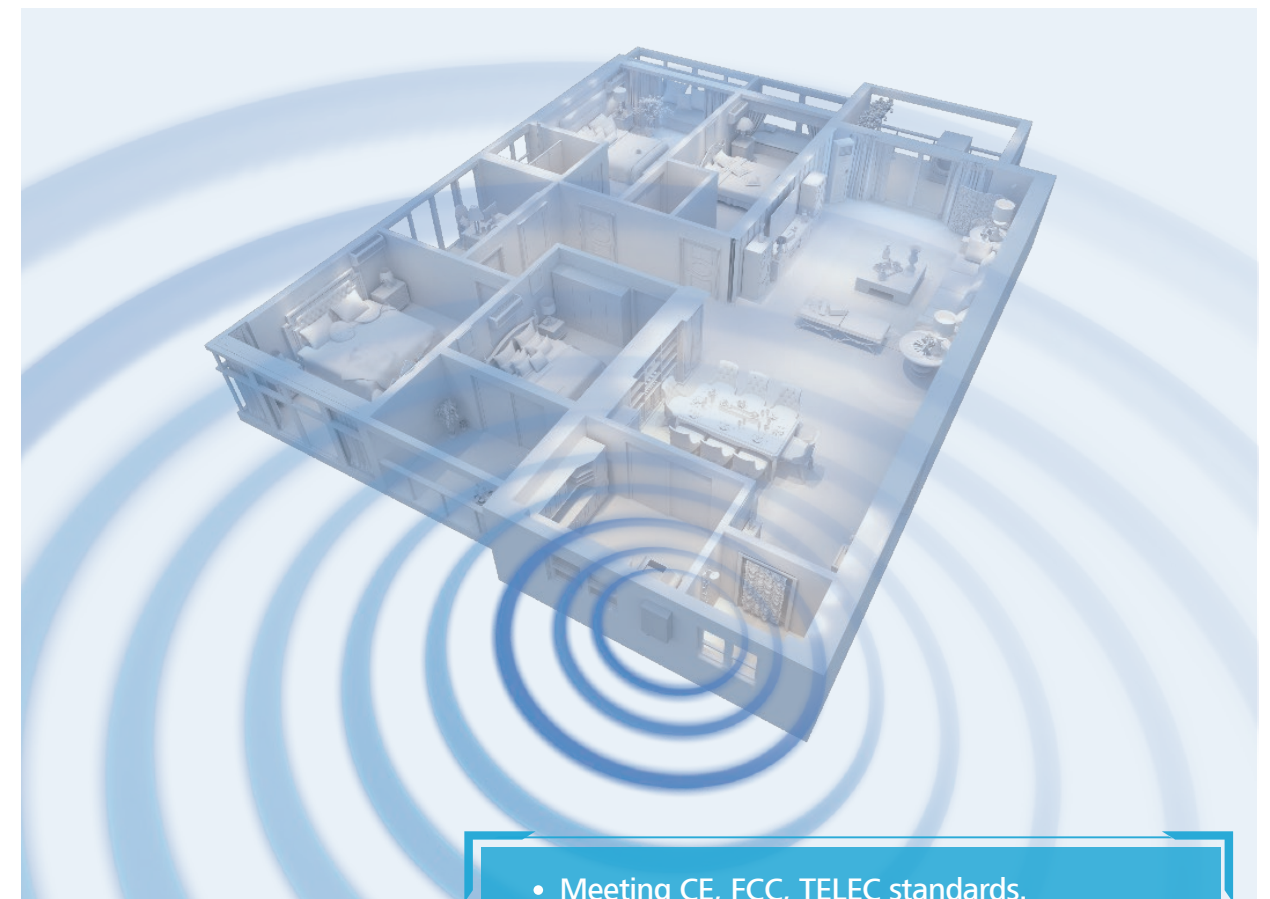
One Click Startup & Better WLAN Connection

One click startup with no complications



Automatic configuration of grid code, time & date, IP address with just one click.

Dual antenna design for a quick, simple and better WLAN connection



- Meeting CE, FCC, TELEC standards.
- Transmission distance up to 200m(in open area), meeting the requirement of home usage.

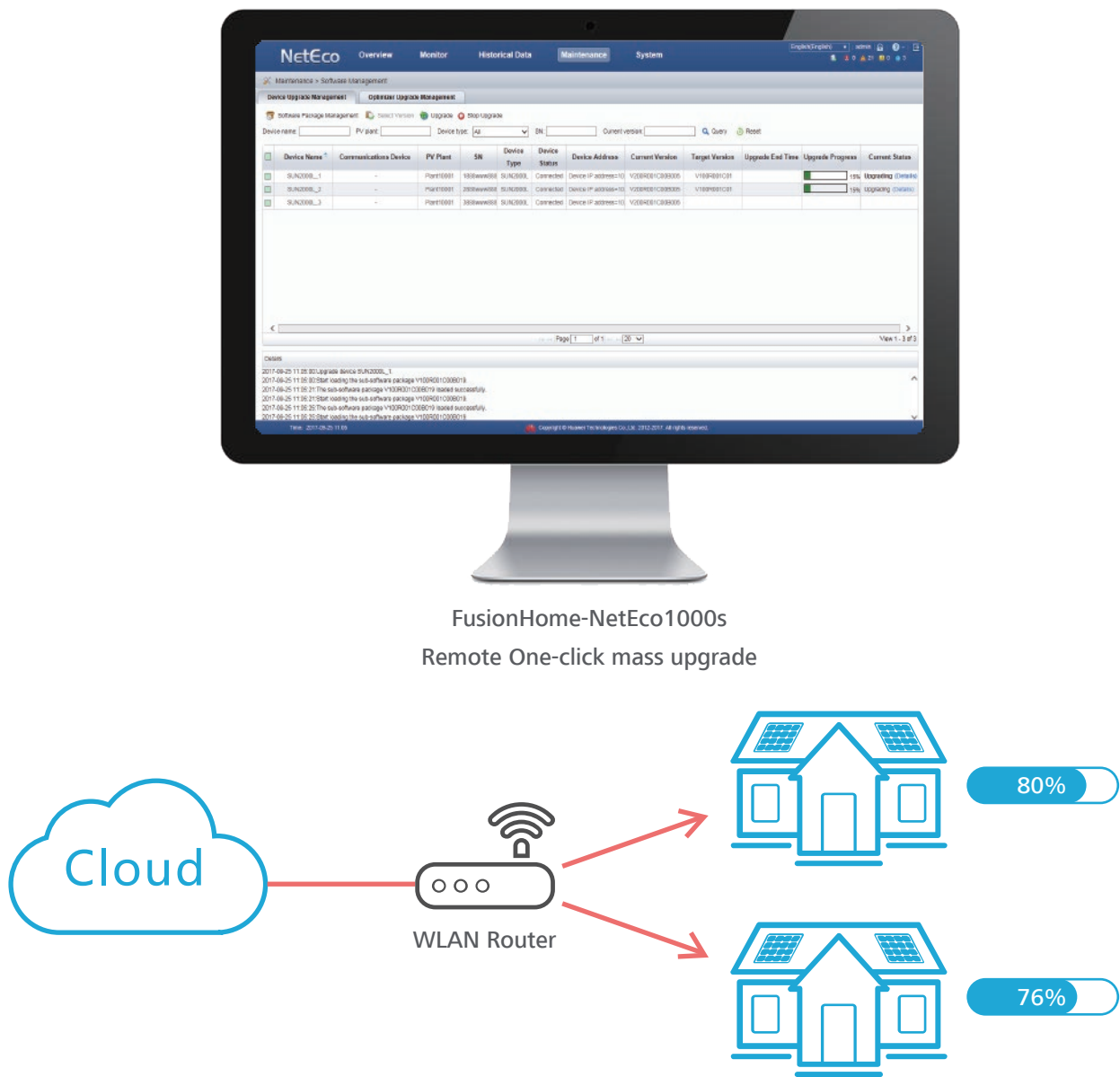
Smart Management

Conventional Upgrade Solution



- Distributed residential PV system cause high cost for manual upgrade onsite.

Huawei one-click mass upgrade solution



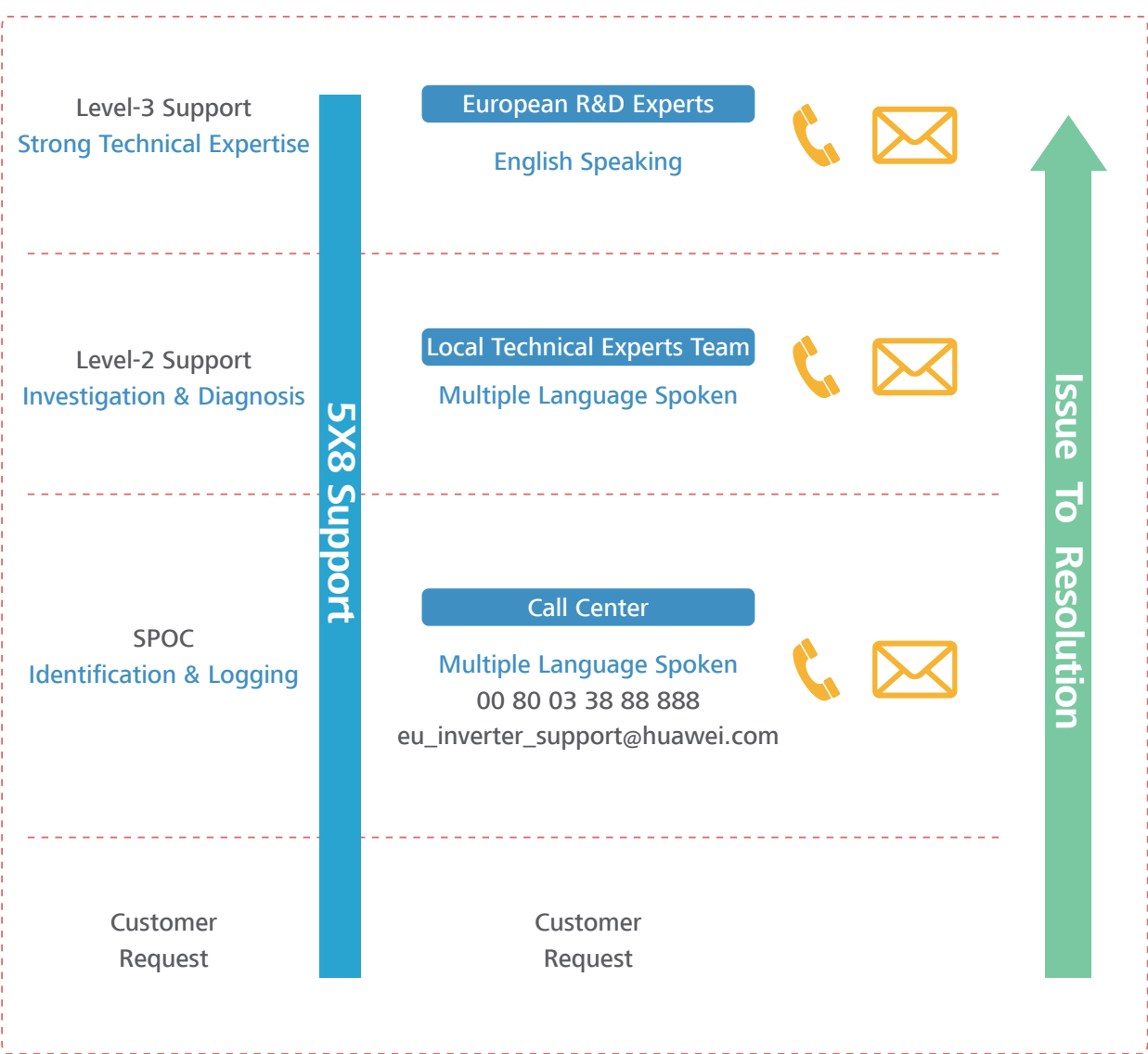
Full Lifecycle Service Guarantee



Huawei's service infrastructure in Europe



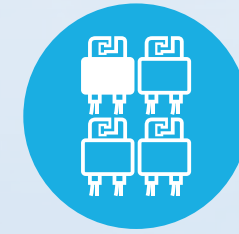
Local Service Support with a Robust Issue-to-Resolution Process



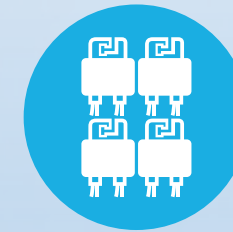
Remote Technical Support: 5X8h
Hardware Replacement Onsite: 2BD



Basic Solution



Partial Optimizer Solution



Full Optimizer Solution

**Recommended
Solution**

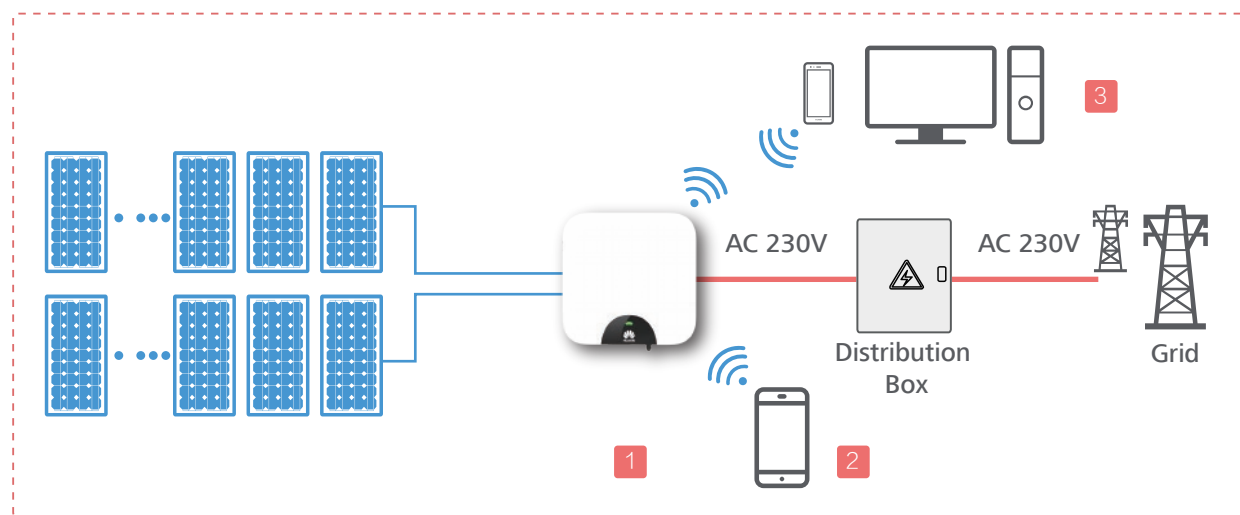


Basic Solution

Applicable Scenario



Basic Solution Overview



Recommended System Configuration

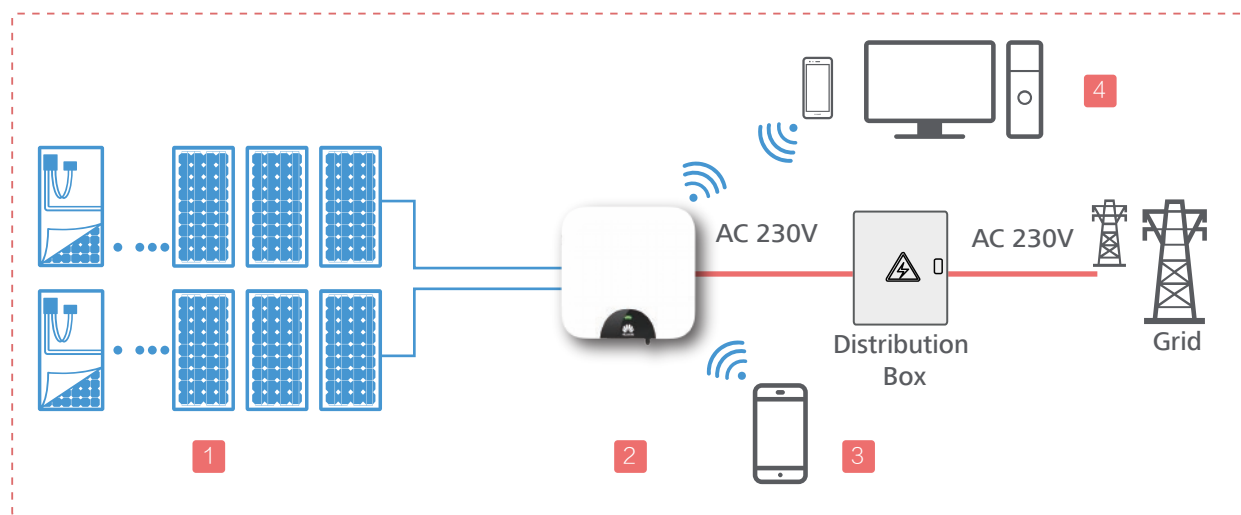
	Device	Model	Qty	Remarks
1	Smart Energy Center	SUN2000L-2/3/3.68/4/4.6/5KTL	1	Offered by Huawei
2	FusionHome APP	Android/iOS	1	Offered by Huawei
3	FusionHome-NetEco1000s Management System & APP	APP: Android/iOS	1	Offered by Huawei
4	Cable	DC Cable: PV1- F 1*4mm ²	/	Purchased by Customer
		AC Cable: ZR- YJV 3*6mm ²	/	Purchased by Customer
		Grounding Cable: 1*10mm ²	/	Purchased by Customer
		Communication Cable: 2*0.5mm ²	/	Purchased by Customer
5	Energy meter	CHINT - DDSU666	1	Purchased by Customer
6	Energy storage system	LG Chem - RESU7H_R/10H_R	1	Purchased by Customer

Partial Optimizer Solution

Applicable Scenario



Partial Optimizer Solution Overview



Recommended System Configuration

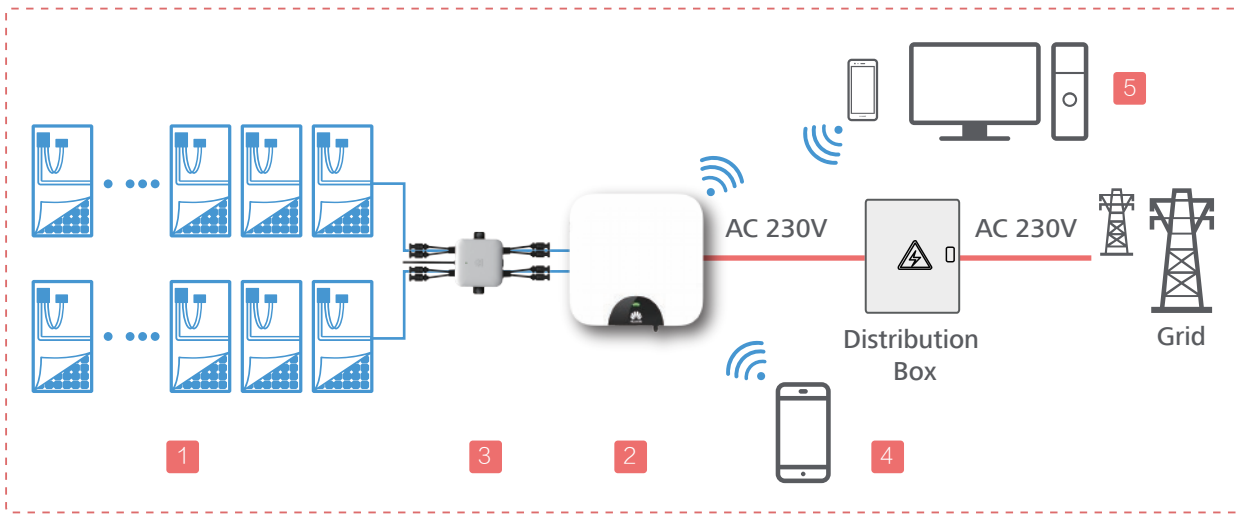
	Device	Model	Qty	Remarks
1	Smart PV Optimizer	SUN2000P-375W	n	Offered by Huawei
2	Smart Energy Center	SUN2000L-2/3/3.68/4/4.6/5KTL	1	Offered by Huawei
3	FusionHome APP	Android/iOS	1	Offered by Huawei
4	FusionHome-NetEco1000s Management System & APP	APP: Android/iOS	1	Offered by Huawei
5	Cable	DC Cable: PV1- F 1*4mm ²	/	Purchased by Customer
		AC Cable: ZR- YJV 3*6mm ²	/	Purchased by Customer
		Grounding Cable: 1*10mm ²	/	Purchased by Customer
		Communication Cable: 2*0.5mm ²	/	Purchased by Customer
6	Energy meter	CHINT - DDSU666	1	Purchased by Customer
7	Energy storage system	LG Chem - RESU7H_R/10H_R	1	Purchased by Customer

Full Optimizer Solution

Applicable Scenario



Full Optimizer Solution Overview



Recommended System Configuration

	Device	Model	Qty	Remarks
1	Smart PV Optimizer	SUN2000P-375W	n	Offered by Huawei
2	Smart Energy Center	SUN2000L-2/3/3.68/4/4.6/5KTL	1	Offered by Huawei
3	Smart PV Safety Box*	SmartPSB2000L	1	Offered by Huawei
4	FusionHome APP	Android/iOS	1	Offered by Huawei
5	FusionHome-NetEco1000s Management System & APP	APP: Android/iOS	1	Offered by Huawei
6	Cable	DC Cable: PV1- F 1*4mm ²	/	Purchased by Customer
		AC Cable: ZR- YJV 3*6mm ²	/	Purchased by Customer
		Grounding Cable: 1*10mm ²	/	Purchased by Customer
		Communication Cable: 2*0.5mm ²	/	Purchased by Customer
7	Energy meter	CHINT - DDSU666	1	Purchased by Customer
8	Energy storage system	LG Chem - RESU7H_R/10H_R	1	Purchased by Customer

* Available in Q1, 2018

Product Specifications



Smart Energy Center



reddot award 2016
winner

Higher Revenue

- High efficiency inverter topology, Max. Efficiency 98.6%, European Efficiency 98.0%

Battery Ready

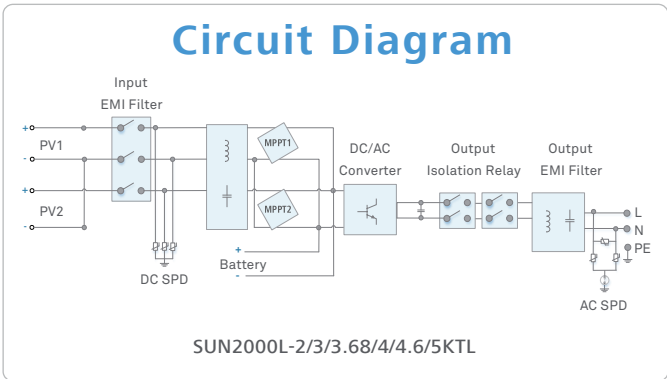
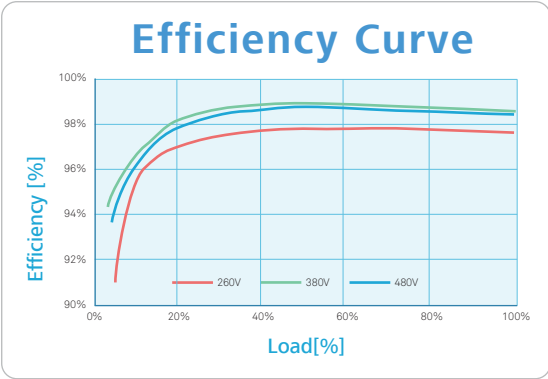
- Integrated energy storage interface

Simple & Easy

- 10.6kg, allows one person simple installation
- Optimized AC connector for quick wiring
- Supports one-click inverter configuration

Safe & Reliable

- IP65, Natural cooling
- Integrated lightening protection for both DC and AC



SUN2000L-2/3/3.68/4/4.6/5KTL

Technical Specification	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
Efficiency						
Max. efficiency	98.4%	98.5 %	98.5 %	98.6 %	98.6 %	98.6 %
European weighted efficiency	97.0 %	97.6 %	97.8%	97.9 %	98 %	98 %
Input						
Recommended max. PV power	2660 Wp	3990 Wp	4968 Wp	5400 Wp	6210 Wp	6750 Wp
Max. input voltage	600 V					
Operating voltage range ¹	90 V~ 600 V					
Start-up voltage	120 V					
Full power MPPT voltage range	120V~480 V	160 V~480 V	190 V~480 V	210 V~480 V	260 V~480 V	260 V~480 V
Rated input voltage	380 V					
Max. input current per MPPT	11 A					
Number of MPP trackers	2					
Max. number of inputs per MPPT	1					
Output						
Rated output power	2000 W	3000 W	3680 W	4000 W	4600 W	5000 W ²
Maximum apparent power	2200 VA	3300 VA	3680 VA	4400 VA	5000 VA ³	5500 VA ⁴
Rated output voltage	220 V / 230 V / 240 V					
Rated AC grid frequency	50 Hz / 60 Hz					
Maximum output current	10 A	15 A	16 A	20 A	23 A ⁵	25 A ⁵
Adjustable power factor	0.8 leading ... 0.8 lagging					
Max. total harmonic distortion	≤ 3 %					
Protection						
Anti-Islanding protection	Yes					
DC reverse polarity protection	Yes					
Insulation monitoring	Yes					
DC surge arrester	Yes					
AC surge arrester	Yes					
Residual current monitoring	Yes					
AC overcurrent protection	Yes					
AC short-circuit protection	Yes					
AC over-voltage protection	Yes					
Over-heat protection	Yes					
General Data						
Operating temperature range	-30 ~ +60 °C (Derating above 45 °C @ Rated output power)					
Relative operating humidity	0 %RH ~ 100 %RH					
Operating altitude	0-4000 m (Derating above 2000m)					
Cooling	Natural Convection					
Display	LED Indicators					
Communication	RS485, WLAN					
Weight (incl. mounting bracket)	10.6 kg					
Dimension (incl. mounting bracket)	375X375X161.5 mm					
Degree of protection	IP65					
Battery Compatibility						
Battery	LG Chem RESU 7H_R / 10H_R					
Voltage range	350~450 Vdc					
Max. current	10 A					
Communication	RS485					
Standards Compliance						
Safety	EN/IEC 62109-1, EN/IEC 62109-2					
Grid connection standards	G83/2,G59/3, EN 50438, CEI 0-21, VDE-AR-N-4105, UTE C 15-712-1, AS 4777					

*1. Only applicable for PV string. The maximum input voltage and operating voltage upper limit will be reduced to 495 V when inverter connects and works with battery.
*2. AS4777:4990W. *3. VDE-AR-N 4105:4600VA / AS4777:4990VA. *4. AS4777:4990VA. *5. AS4777:21.7A.

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Smart PV Optimizer



Higher Revenue

- Max. efficiency 99.5%, weighted efficiency 99.0%
- Allows more panels on each roof to achieve higher system yields

Simple & Easy

- Supports installation in shade prone areas and in different directions
- Quick frame mount at warehouse, less rooftop installation time
- Supports remote module-level monitoring

Safe & Reliable

- IP68, support outdoor application
- Communication through DC Power Line Communication
- Single module shutdown capability to secure people and assets safety

TechnicalSpecification	SUN2000P-375W
Input	
Rated input power	375 W
Absolute maximum input voltage	80 V
MPPT operating voltage range	10-80 V
Max. input current	12 A
Max. efficiency	99.5 %
Weighted efficiency	99 %
Overvoltage category	II
Output	
Max. output voltage	80 V
Max. output current	15 A
Output bypass	Yes
Standard Compliance	
Safety	IEC62109-1 (class II safety)
RoHS	Yes
General Specification	
Maximum allowed system voltage	1000 V
Communication	PLC
Dimensions (W x L x H)	125*85*25.5 mm
Weight (including cables)	0.7 kg
Installation Part	PV module frame / Aluminum extrusion profile Optional
Input connector	MC4
Output connector	MC4
Output wire length	47 in / 1.2 m
Operating temperature/humidity range	-40 to 85 ℃ / 0-100 %
Protection rating	IP68
PV System Design Using A SUN2000L Inverter	
Minimum String Length	According to inverter design rules & PV module datasheet
Maximum String Length	
Maximum Power per String	

Smart PV Safety Box (Preliminary Version)



Simple & Easy

- Communicate with optimizers through Power Line communication
- Support module-level real time monitoring & management

Safe & Reliable

- Single module shutdown capability to secure people and assets safety
- IP65, support outdoor application

Technical Specification	SmartPSB2000L
DC Input	
Maximum input voltage	1100 V
Number of inputs	2
Maximum input current per input	15 A
DC Output	
Maximum output voltage	1100 V
Number of outputs	2
Maximum output current per output	15 A
Features	
Module-level remote management	Yes
Onsite master module shutdown	Yes
Remote auto module shutdown	Yes
General Specification	
Dimensions (H x W x D)	148 x 148 x 38 mm
Weight	3 kg
Display	LED
Communication	PLC, RS485
Input type	HH4
Operating temperature range	-30 to 60 ℃
Protection rating	IP65

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FusionHome-NetEco1000S Inverter Management System



Smart

- Easy data accesses on mobile devices
- Proactive reports of yields and alarms

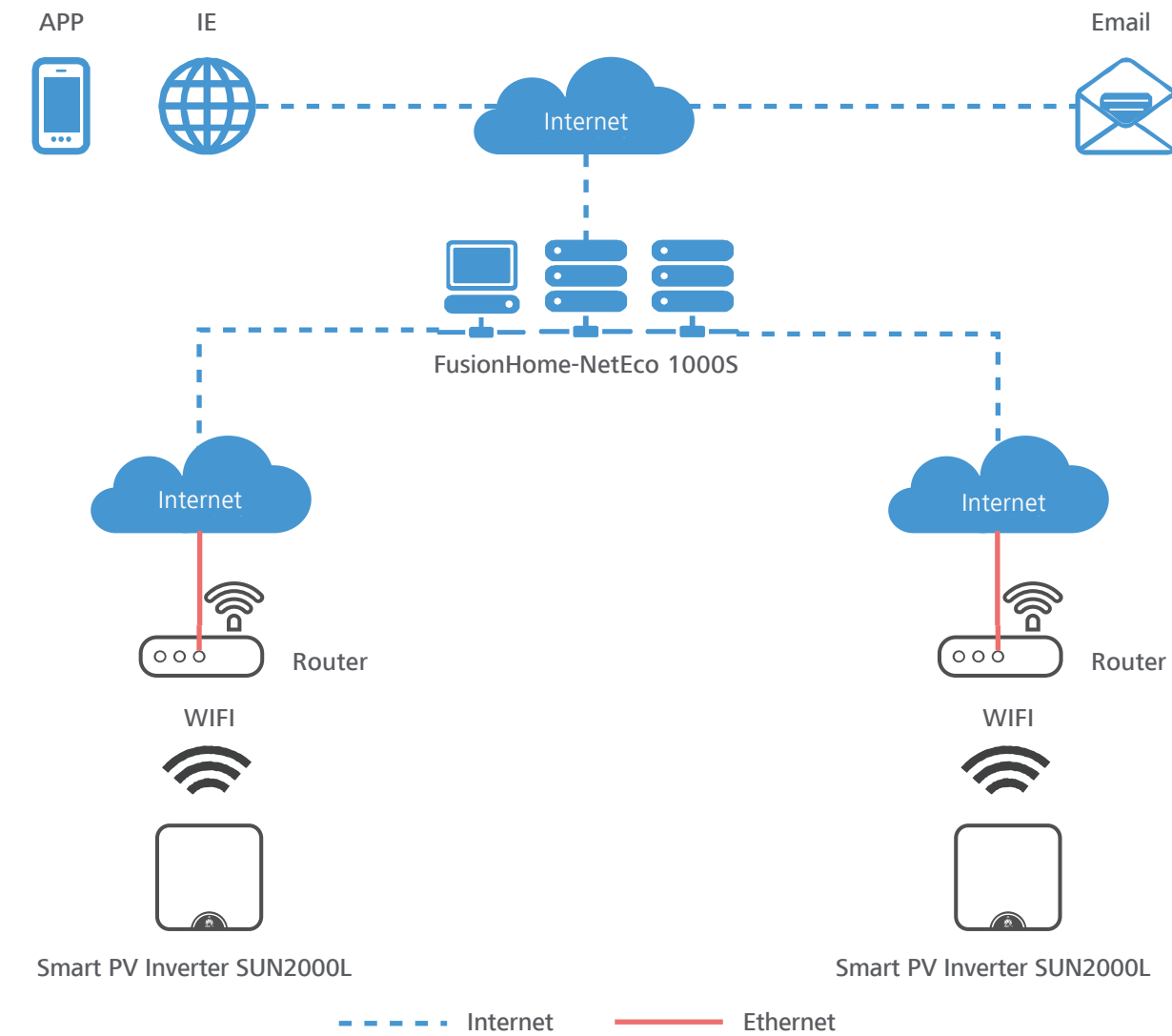
Simple

- One-click installation and register
- Fault alarms via E-mail

Stable

- Centralized management
- Up to 20 years data storage

Network Structure



FusionHome-NetEco1000S Function List

Num.	Function	Description
1	APP	<ul style="list-style-type: none">• Supports Android 4.0 and iOS 5.0 or above• Graphical display of the alarm, power and other information
2	Alarm Management	<ul style="list-style-type: none">• Collect, store and browse history alarm, current alarm, unrecovered alarm and recovered alarm
3	Real-time Monitoring	<ul style="list-style-type: none">• Browse detailed real-time device Information, include the alarm, KPI and device state• Support remote control
4	KPI Management	<ul style="list-style-type: none">• Browse the KPI• Analyze the power, and inverter data compare
5	Device Management	<ul style="list-style-type: none">• Device parameter setting• Device software update, and support remote update the software
6	User rights Management	<ul style="list-style-type: none">• According to the user role, provide different permissions
7	Remote Notifications of Alarms and Reports	<ul style="list-style-type: none">• Through configuration on the server sending rules, the alarms and reports could be sent to user's email automatically



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Tel.:400-822-9999

Version No.:20160818

<http://solar.huawei.com>