

**SOLAR FINANCE
& INVESTMENT
EUROPE**

FUSION SOLAR SMART PV SOLUTION



**SEBASTIAN MOHR
HUAWEI**



MARATHON CAPITAL





FusionSolar® Smart PV Solution

Exceed your profit targets through
Digitalization | Networking | Higher Yields

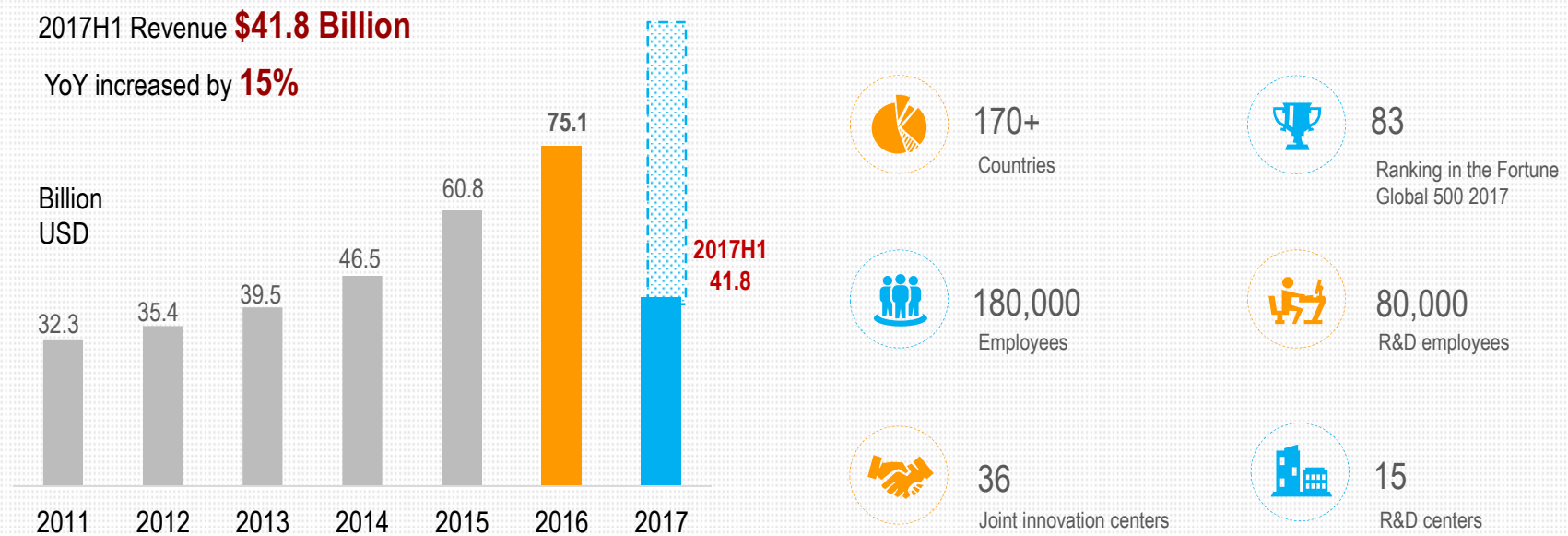
FusionSolar®



Corporate Introduction & Smart PV Success Story So Far...

FusionSolar®

Continuously Creating Values for Customers Achieving Sustainable Business Growth



Continuous Strong Investment in Innovation

Invested in total **\$10.99** Billion in 2016

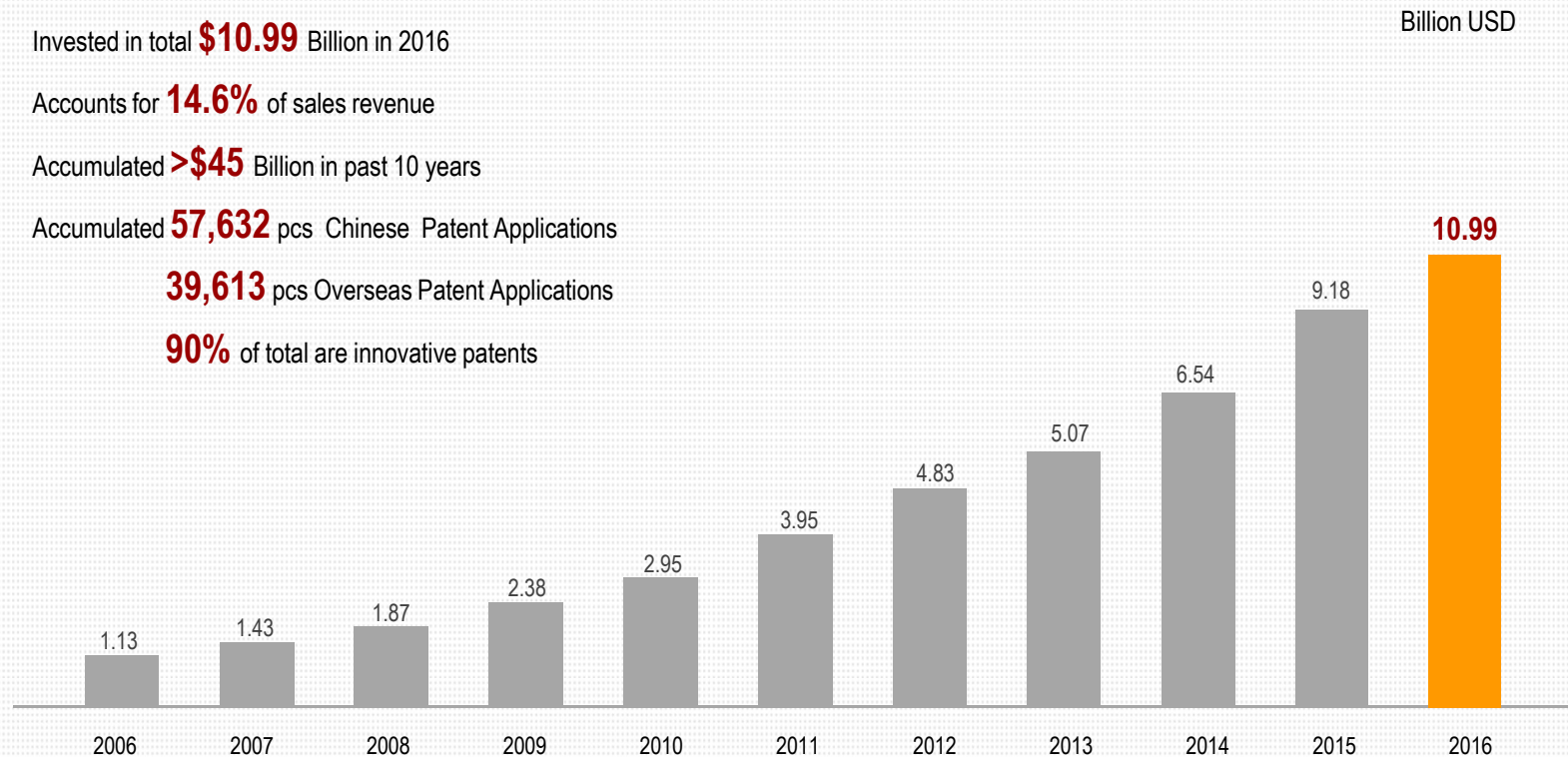
Accounts for **14.6%** of sales revenue

Accumulated **>\$45** Billion in past 10 years

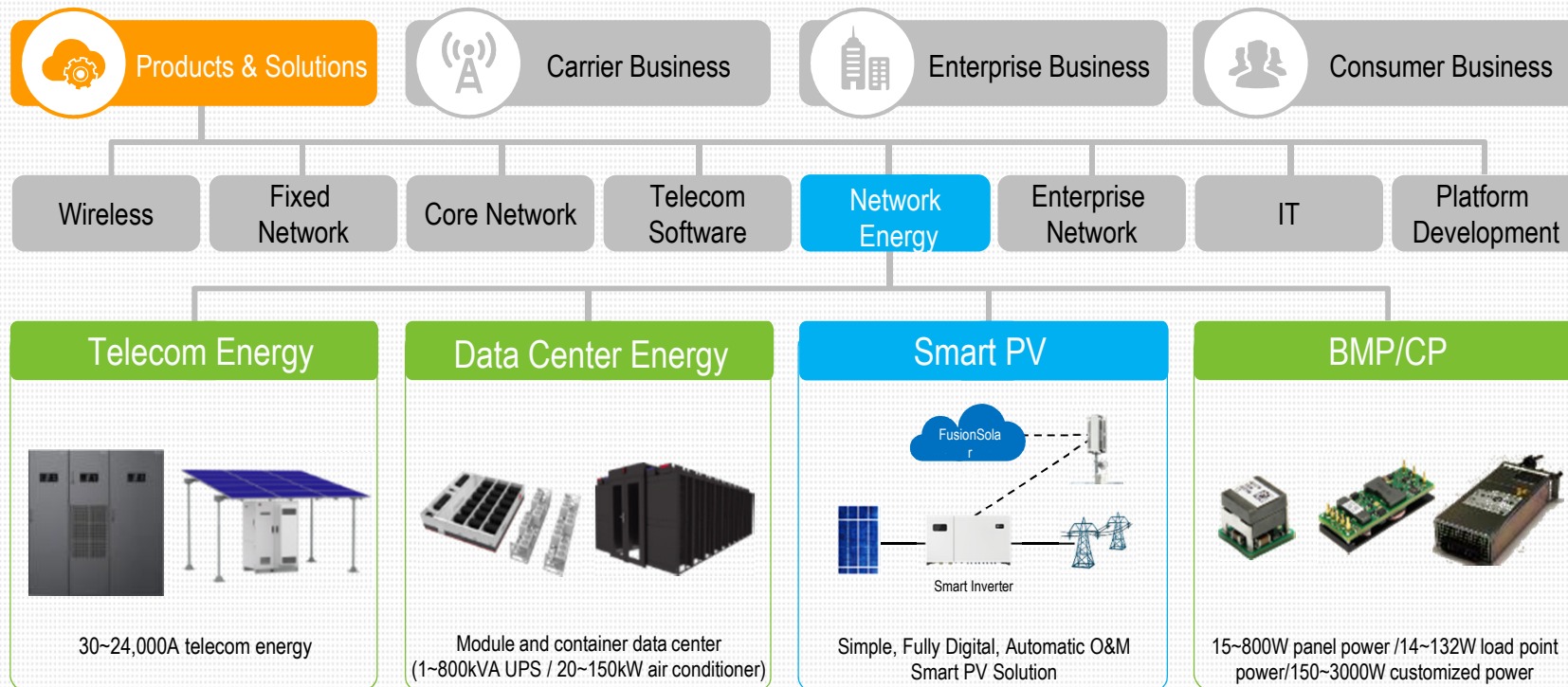
Accumulated **57,632** pcs Chinese Patent Applications

39,613 pcs Overseas Patent Applications

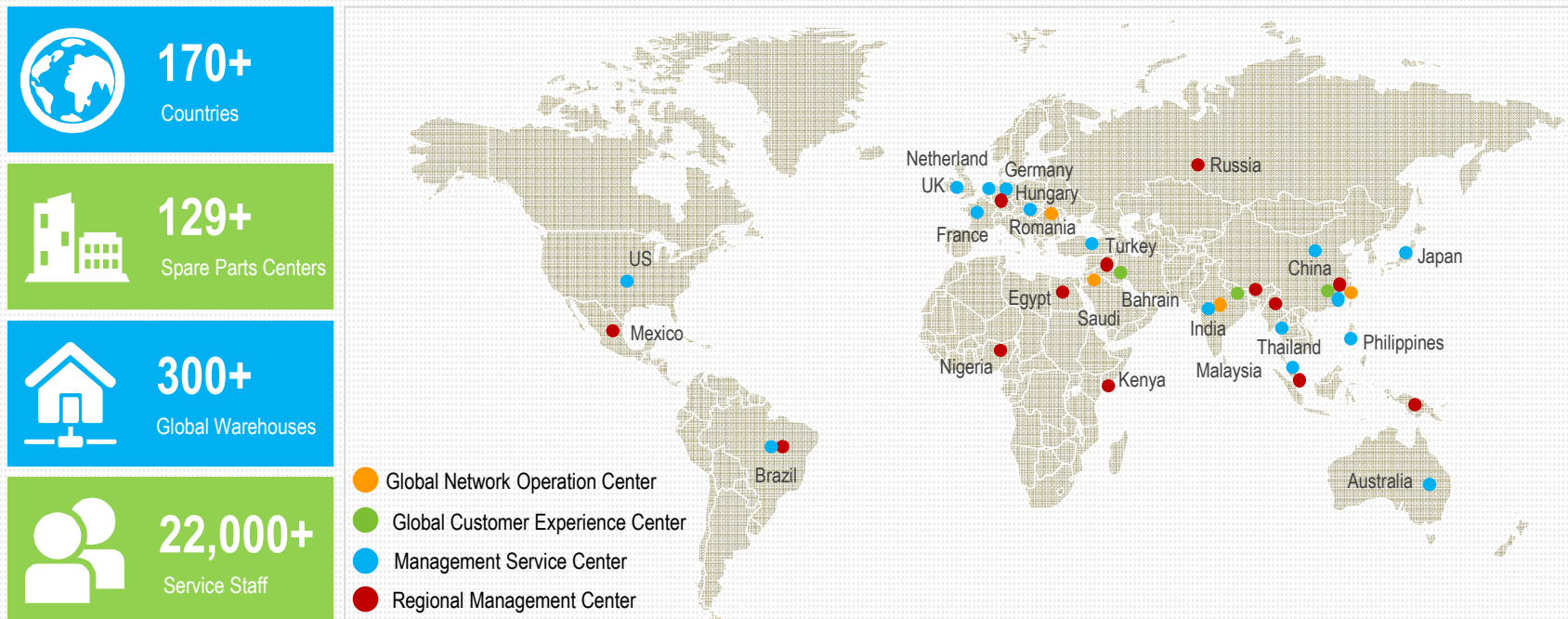
90% of total are innovative patents



Providing Leading Solutions in Network Energy



Huawei GTS (Global Technical Service) is a Shared Platform Available for All Products, including Smart PV



Huawei in Europe

A Local
ICT Provider
in Europe



33
Countries



18
R&D Sites



11,000+
Employees



1,900+
R&D employees



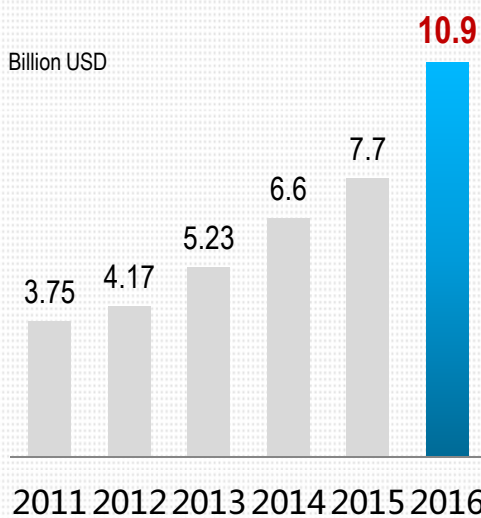
7
Training Centers



2
Regional HQs

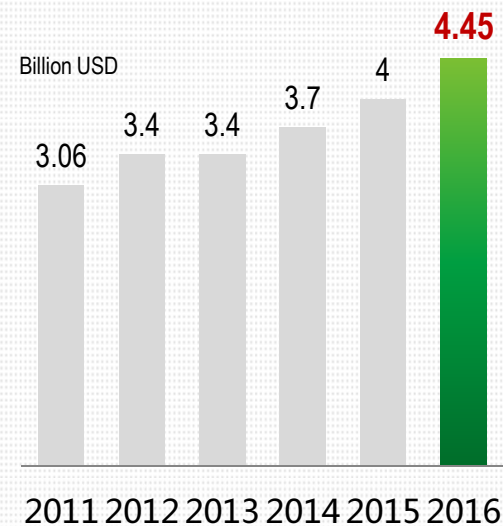
Sales
Revenue

Billion USD



Procurement
Amount

Billion USD



Huawei has a Proven Track Record With Stable Performances in Challenging Environments

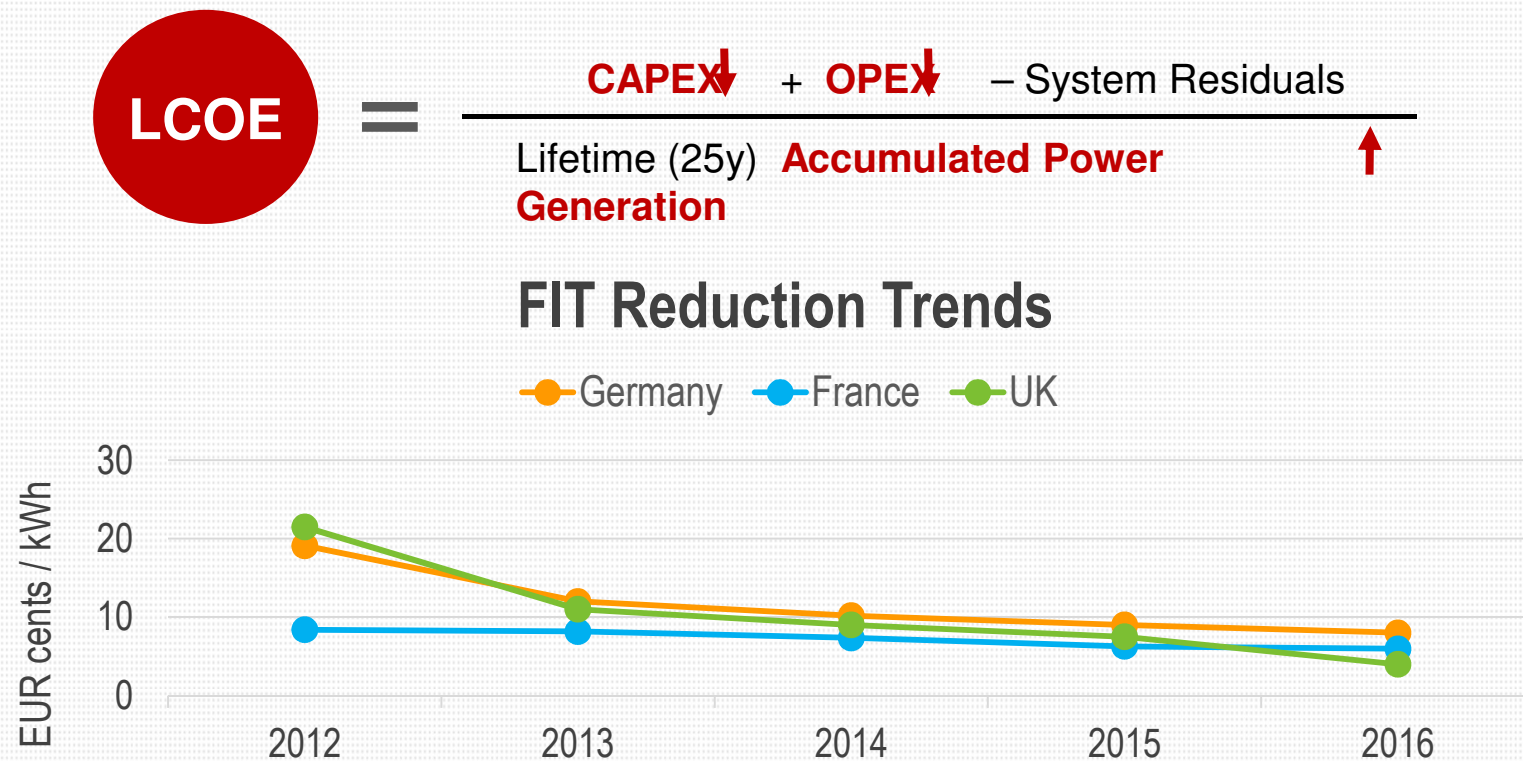




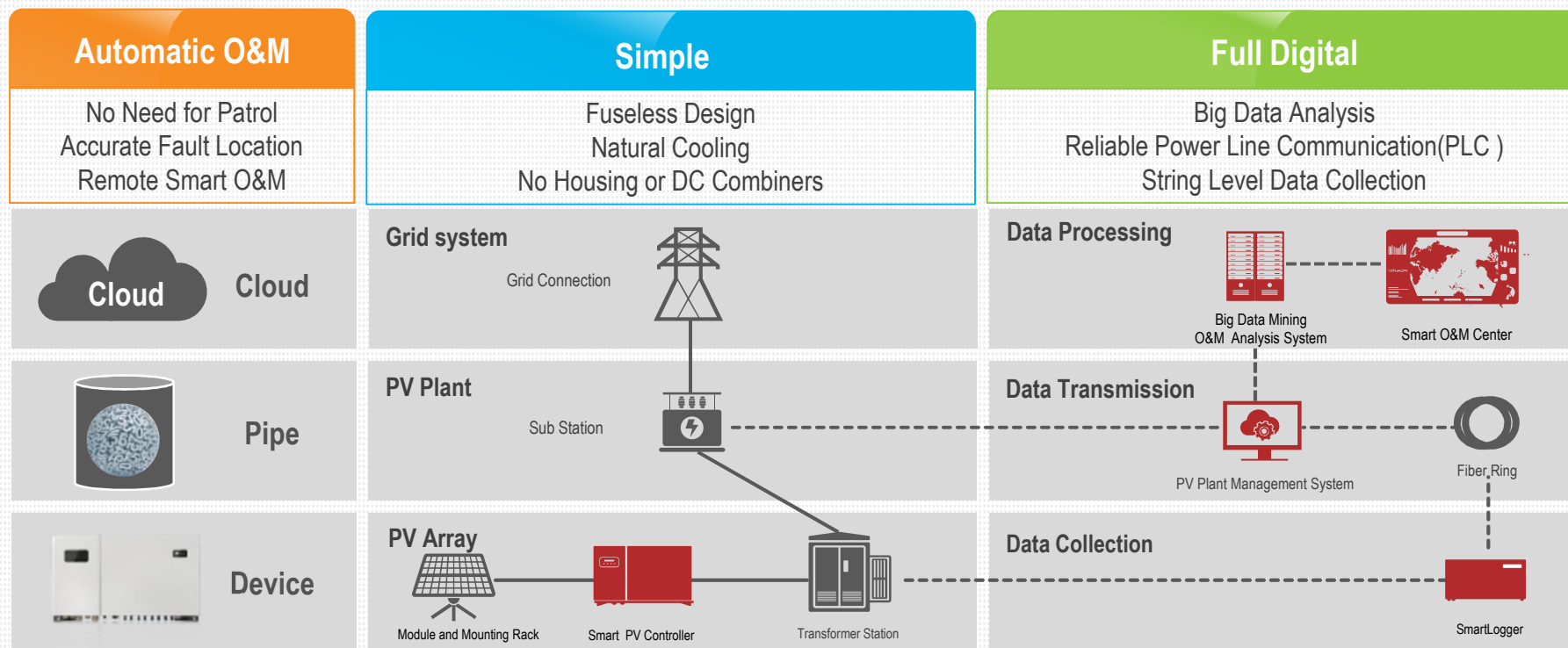
A Creative Look at the Solar PV Investment Challenges

FusionSolar®

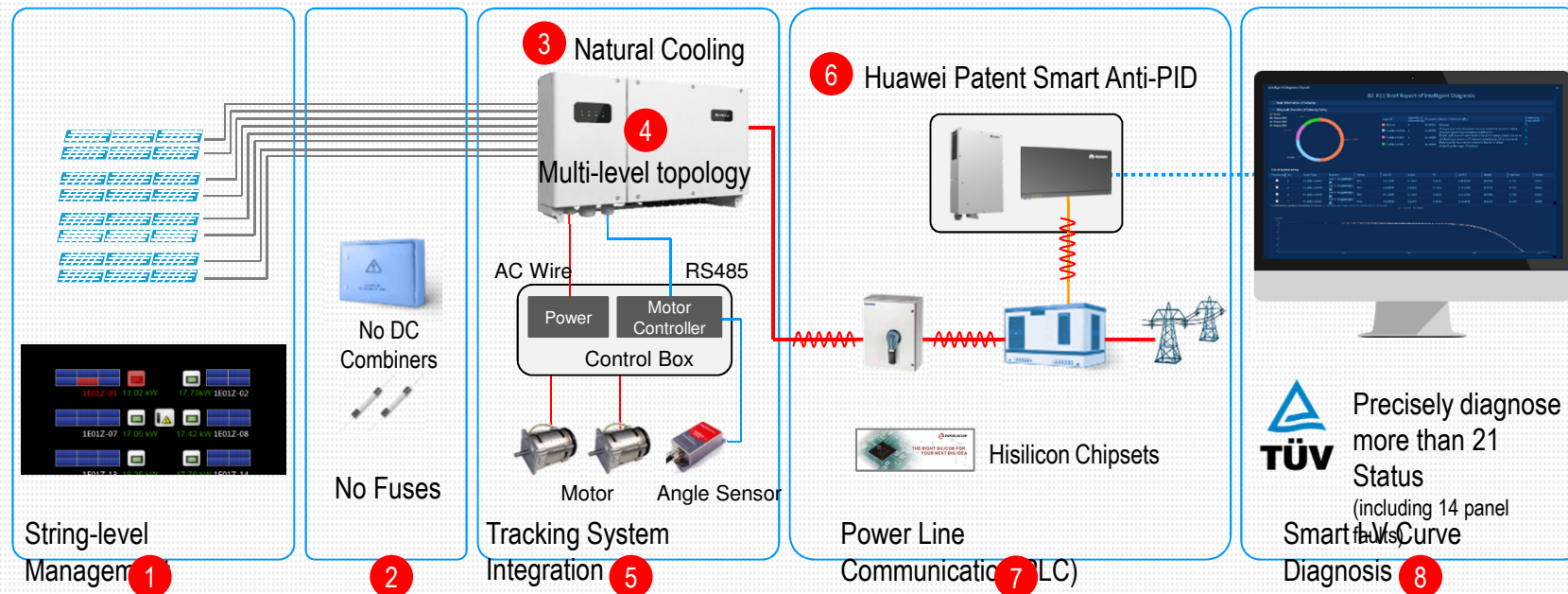
FIT Reduction Pushes Investors to Seek Innovative Solutions With Lower LCOE



FusionSolar[®] Smart PV Solution: A Simple, Fully Digital Solution with Automatic O&M



Eight Unique Innovations to Support to Lower LCOE



FusionSolar® Smart PV Solution Contributes to a Lower System LCOE

$$\begin{array}{c}
 \text{LCOE} \\
 \text{LEVELIZED COST OF ELECTRICITY}
 \end{array}
 \downarrow
 =
 \frac{
 \begin{array}{c}
 \xrightarrow{\text{green arrow}} \\
 \text{CAPEX}
 \end{array}
 +
 \begin{array}{c}
 \text{25-year OPEX} \\
 \downarrow
 \end{array}
 - \text{System Residuals}
 }{
 \begin{array}{c}
 \text{25-year Power Yields} \\
 \uparrow
 \end{array}
 }$$

	CAPEX	OPEX	Higher Yields
1. String-level Management	+	-	+
2. No DC Combiners & Fuses	-	-	+
3. Natural Cooling	+	-	+
4. Multi-level Topology	-	-	+
5. Tracking System Integration	-	-	+
6. Smart Anti-PID	+	-	+
7. Power Line Communication	-	-	+
8. Smart I-V Curve Diagnosis	→	↓	↑
Total			

Values of FusionSolar® Smart PV Solution



Higher Yields

> 2% UP



Smart O&M

50% higher efficiency



**Safe &
Reliable**

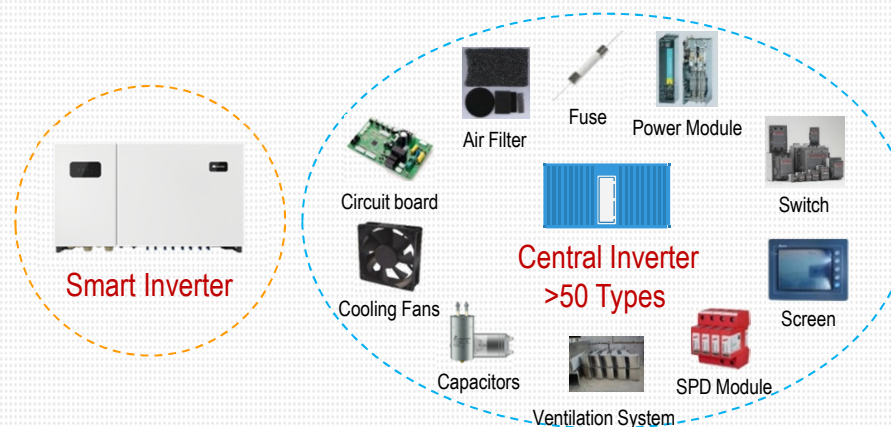
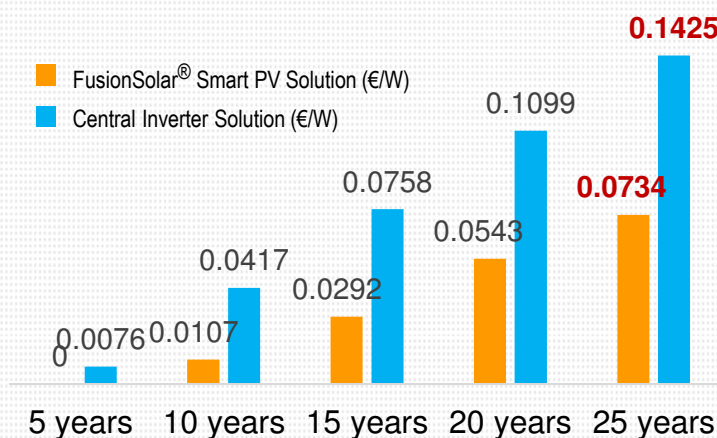
25 Years' Reliability



**Equivalent
CAPEX**

Higher IRR

Smart O&M, OPEX Saving €6.91m in 25 years/100MW



	FusionSolar® Smart PV Solution	Central Inverter Solution
Maintenance	None	Necessary for vulnerable components
Spare parts guarantee	Included in 10/15/20 years warranty extension. 2 BD Guaranteed, easy to replace	Much more complex
Diagnosis and repair		Professional expertise, no guarantee of resolution time
OPEX Savings: €6.91 cents/W		

Verified by TÜV 'Excellent Inverter Performance and Operation'

Safe & Reliable

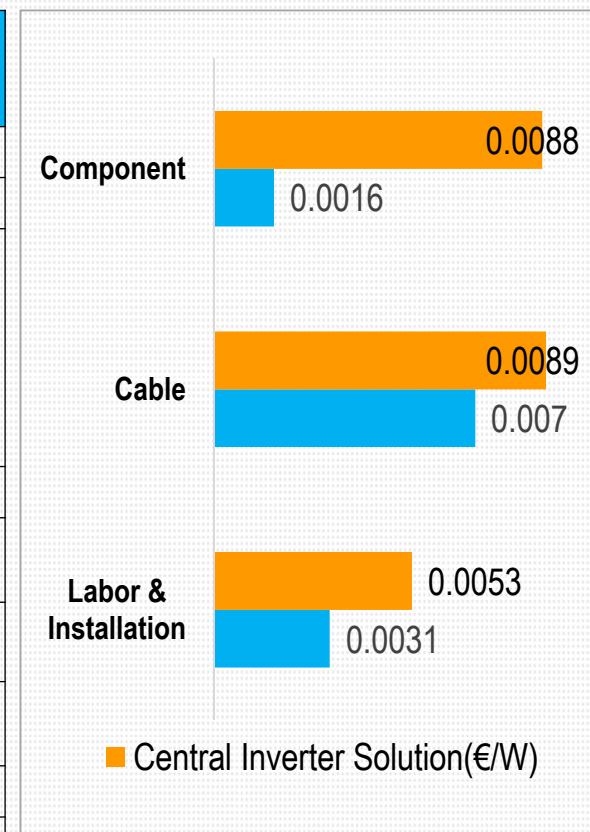


	Inverter Model	Installed Volume	MW	COD	Running days	Annual failure rate	Availability
Station phase II	SUN2000-20KTL	200 sets	4	17 th Dec 2013	963 days	0.189%	99.998%
Station phase III	SUN2000-28KTL	4939 sets	130	27 th Dec 2014	583 days	0.252%	99.996%
Station phase IV	SUN2000-40KTL	1790 sets	60	11 th Jan 2016	207 days	0.390%	99.996%
Station phase V	SUN2000-50KTL	700 sets	30	1 st Jun 2016	/	/	/

CAPEX Saving €1.13 cents/W (Excluding Transformers and Inverters)

Equivalent
CAPEX

Central Inverter Solution 2.5MWac / Array		FusionSolar® Smart PV Solution 2.5MWac / Array	
Item	€/W	Item	€/W
DC Combiner	0.0088	AC Box	0.0016
Inverter Transformer Station	Outdoor Inverter	Huawei Smart Inverter	--
	DC Distribution Included	Transformer Station	
	Transformer	PLC Module	
	MV Switchgear		
Cables	0.0089	Cables	0.0070
Foundation of Inverter Transformer Station	0.0027	Foundation of Transformer Station	0.0003
Inverter and Transformer Installation	0.0001	Inverter Installation	0.0007
Labor related to DC Combiner & Cables	0.0025	Labor related to AC Box & Cables	0.0021
Total	0.0230	Total	0.0117
Price difference: €1.13 cents/W			



Specifications of SUN2000-60KTL-HV-D1-001



SUN2000-60KTL-HV-D1-001

Efficiency

Max. Efficiency	99.0%
European Efficiency	98.8%

Input

Max. Input Voltage	1,500 V
Start Input Voltage	650 V
Min. Operating Voltage	600 V
MPPT Operating Voltage Range	600 V ~ 1,450 V
Rated Input Voltage	1,080 V
Max. Number of Inputs	8
Number of MPP Trackers	4

Output

Rated AC Active Power	60,000 W
Max. AC Apparent Power	66,000 VA
Rated Output Voltage	800 V, 3W+PE
Rated Output Current	43.3 A
Rated AC Grid Frequency	50 Hz / 60 Hz
Max. Output Current	48 A
Adjustable Power Factor	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	< 3%

General

Dimensions (W×H×D)	930 × 600 × 270 mm (36.6×23.6×10.6 inches)
Weight	60 kg (132 lb.)
Operation Temperature Range	-25 °C ~ 60 °C (-13°F ~ +140°F)
Max. Operating Altitude Without Derating	4,000 m (13,123 ft)
Relative Humidity	0 ~ 100%
Protection Rating	IP65

Specifications of SmartLogger2000



SmartLogger2000

Device Management

Max. Number of Manageable Devices	200
Max. Number of Manageable Smart Inverters	150

Communication Interface

Electrical Ethernet	ETH × 2, 10 / 100 Mbps
Optical Ethernet (optional)	SFP × 2, 100 Mbps
RS485	COM × 6, 4800 / 9600 / 19200 bps
PLC	PLC × 1, 115.2 kbps
Digital / Analog Input / Output	DI × 8, DO × 3, AI × 7, AO × 4, PT100/1000*2
3rd Party Monitoring Compatibility	Solar-Log, Meteocontrol, Skytron, etc.

Communication Protocol

Ethernet	MODBUS-TCP, IEC 60870-5-104
RS485	MODBUS-RTU, IEC 60870-5-101/103

Environment

Operating Temperature	-40°C ~ +60°C (-40 °F ~ +140 °F)
Storage Temperature	-40°C ~ +85°C (-40 °F ~ +185 °F)
Relative Humidity (Non-Condensing)	5% ~ 95%
Operating Altitude	0 ~ 4,000m (0 ~ 13,123 ft.)

General

Adapter Power Supply	100 Vac ~ 240 Vac , 50Hz / 60Hz
Power Consumption	Min. 8W, Max. 15W
Dimensions (W/H/D)	350 × 170 × 44 mm (13.8 × 6.7 × 1.7 inches)
Weight	3.8 kg (8.4 lb.)

Always Available for Highest Yields



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