

SolarToday & Huawei Meeting

Online



SolarToday 

 HUAWEI

Content



Huawei as a Sustainable Company

Huawei Solar Business

Dutch Solar Trend

Bring digital to every person, home and organization for a fully connected, intelligent world



Sustainable business growth with large operation scale & diversified business groups

 **170+**
Countries and regions

 **61 in**
Fortune Global 500

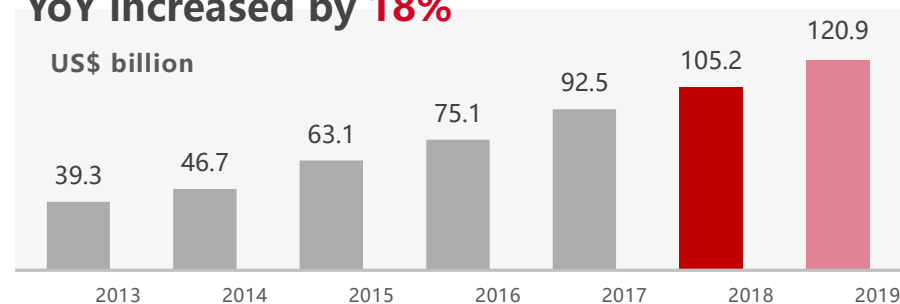
 **194,000**
Employees

 **96,000+**
R&D employees

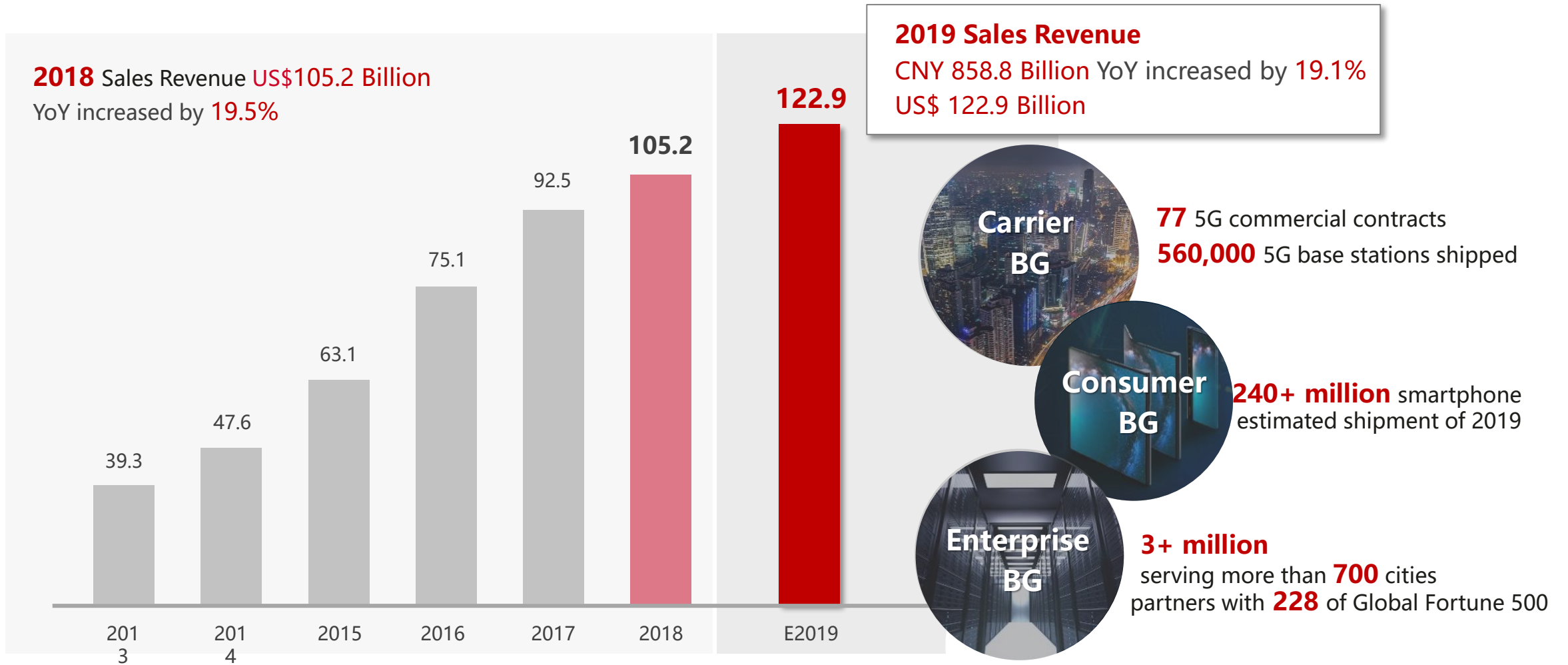
 **14**
Research institutes/
labs/centers

 **74 in**
Interbrand's Top 100
Best Global Brands

2019 Est. Sales Revenue US\$120.9 Billion
YoY increased by **18%**



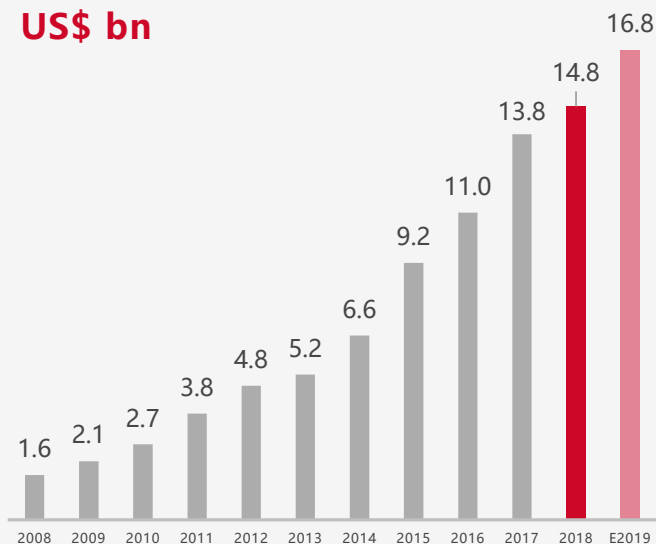
Continuously Creating Values for Customers Rose to the Challenges, Sustainable Robust Growth



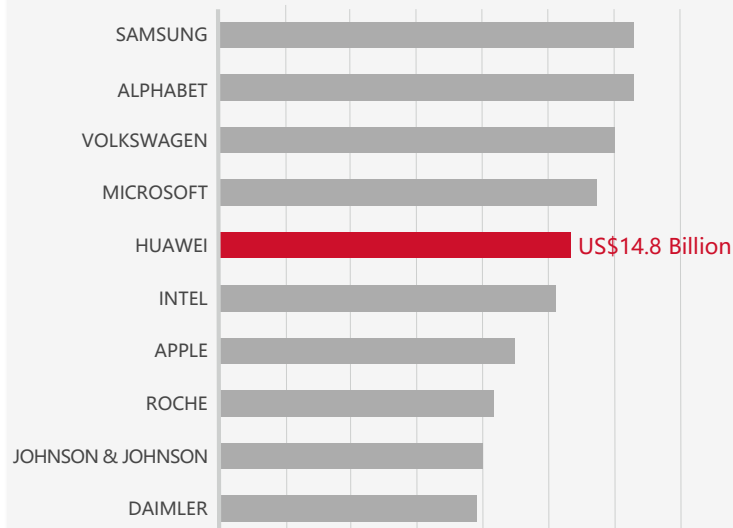
Sustained Investment in R&D Drives Technology Breakthroughs

Continuous strong investment in R&D,
> 10% annually. Accumulated
USD 70 billion over the past decade

US\$ bn



Ranked 5th in 2018 EU Industrial R&D
Investment Scoreboard by European
Commission, JRC/DG RTD



By the end of 2018, a total of 87,805
patents applications have been granted,
above 90% were invention patents



First 5G chipset
Balong 5G01



AI Powered
Kirin 980 chipset




First AI powered
Solar module diagnosis

A Brand Admired and Trusted by Consumers

Global Brand Awareness 93%



HUAWEI Mate30|30 Pro^{5G}
CO-ENGINEERED WITH 

5G Rethink Possibilities



HUAWEI Mate X
CO-ENGINEERED WITH 

World's Fastest 5G Foldable Smartphone

240 million units

Smartphone shipments in 2019
(estimated, by December 31, 2019)

Top 2

Global smartphone shipments

17.6%

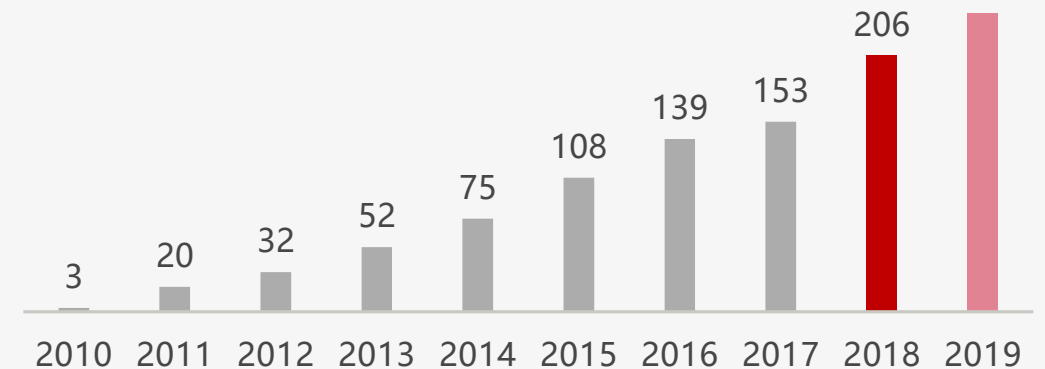
Global smartphone market share

93%

Increasing global brand awareness

Source: IPSOS

Smartphone shipment units (million)



Content



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The European PV Market Keeps Sustained and Rapid Development



Control the temperature increase 2°C, Developing the new energy



Renewable energy accounts for 32% by 2030

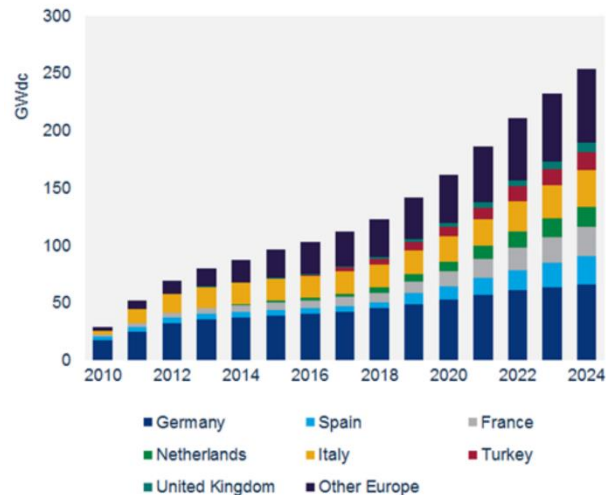


Panel price drops 30%,
pv systems price drops 10%+



Solar PV electricity price close to Thermal power

Cumulative solar PV installations, Europe, 2010-24



Utility company

EDF

By 2030, complete 30GW photovoltaic construction

Engie

Switch to Renewable energy by 2025, complete 3GW within 3 years

ENEL

100% renewable energy supply by 2050, complete 3GW within 3 years

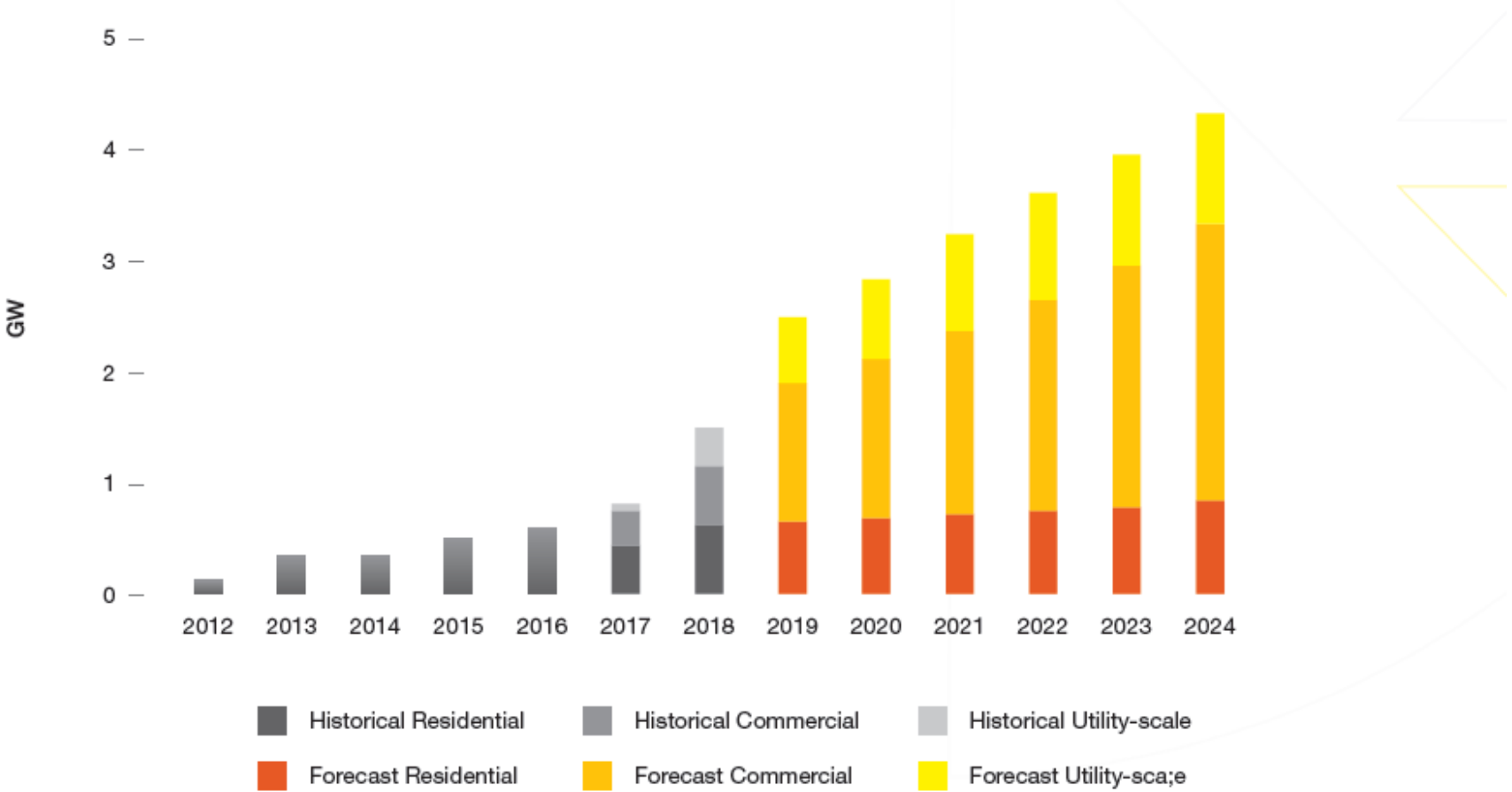
TOTAL

Transfer to clean energy, develop more than 4GW within 2 years

Target

The Netherlands PV Market Growing even faster since 2018

FIGURE 30 NETHERLANDS SOLAR PV MARKET SCENARIOS 2019 - 2024, BY HOLLAND SOLAR



Source: Holland Solar.

European PV Market Three Major Scenarios

Utility scale



- NL the largest PV project Solarcentury
- Big utility, mountainous, on surface of the water and so on.
- Business model is to generate the power to the grid

Commercial & Industry



- Commercial rooftop and residential
- Self- consumption
- Business model is to sell the power which more than needed

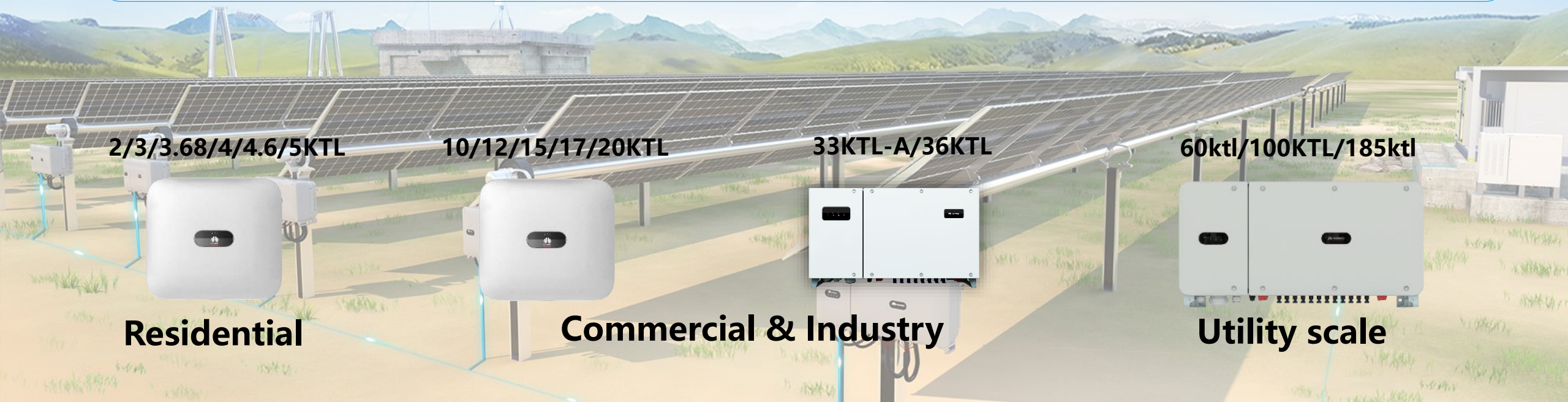
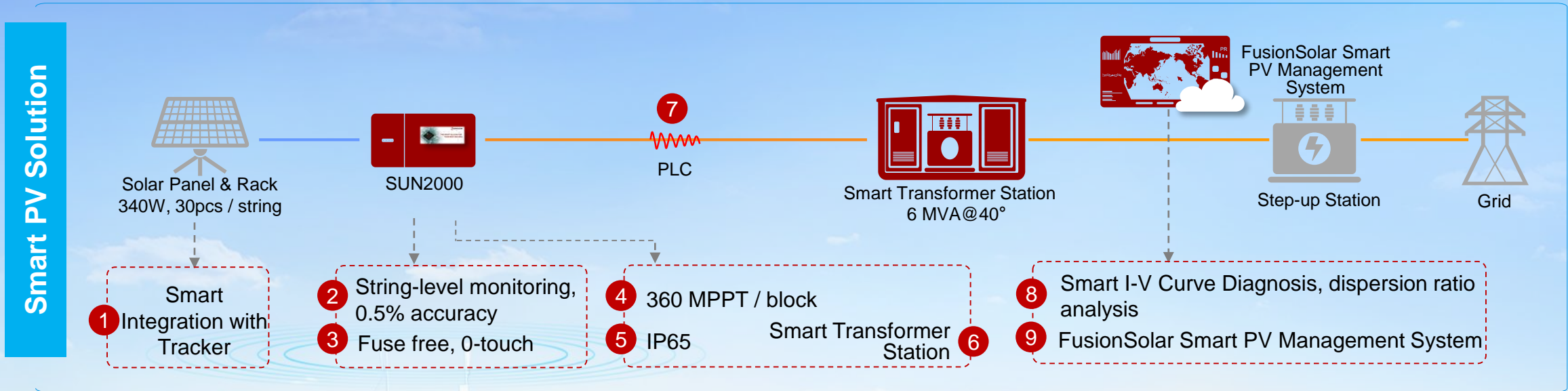
Residential


















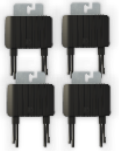




- The business model is self-sufficient, the excess power is directly integrated into the grid, and the grid is bought at the sale price

Where is the sun we can converter renewable energy for people.

FusionSolar Smart PV Solution Overview

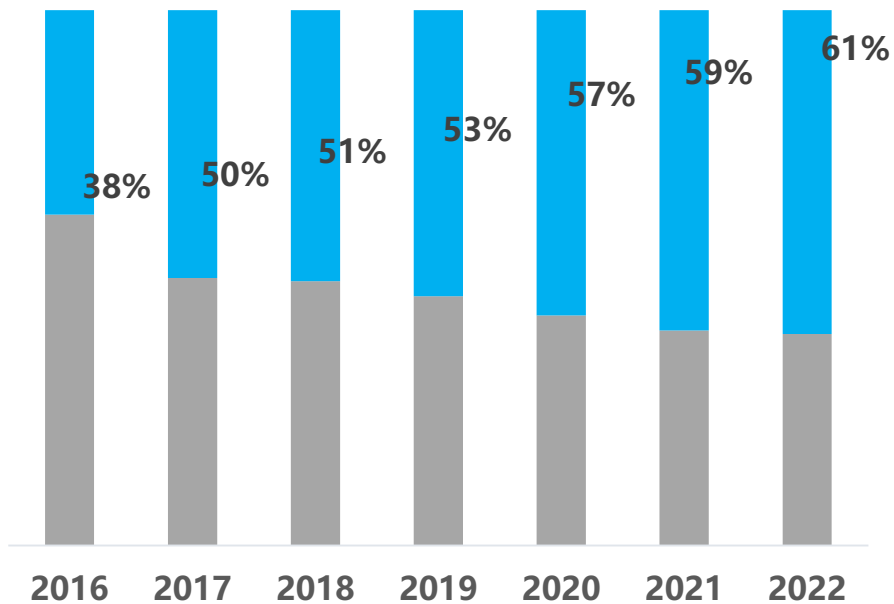


Huawei FusionSolar - Smart PV Solutions for All Scenarios

	Smart String Inverter and Transformer			Smart Array Controller & Smartlogger		Management System		
Utility	 100KTL-M1	 185KTL-H1(EU)	 Transformer-6/2.5MVA	 SmartLogger 3000B	 Smart ACU2000B	 FusionSolar Management System		
Commercial & Industry	 12-/20KTL-M0	 33KTL-A	 36KTL 36KTL - AFCI	 60KTL-M0	 100KTL-M1	 Smart Dongle for 60KTL	 SmartLogger3000A	 FusionSolar Cloud
Residential	 2~6 KTL-L1 (Single Phase)	 Optimizer	 3-10KTL-M0 (3-Phase)	 Smart Power Sensor	 Smart Dongle WLAN+Ethernet	 Smart Dongle 4G		

Continuous Innovation, Leading Solar Industry Development

String solution has been the **MAINSTREAM** in utility



Huawei Smart PV 118GW
Accumulative Global Shipment
by the end of 2019



Support Global Customers Success with Lower LCOE

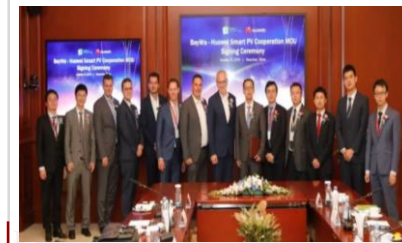
Group Ortiz & Huawei



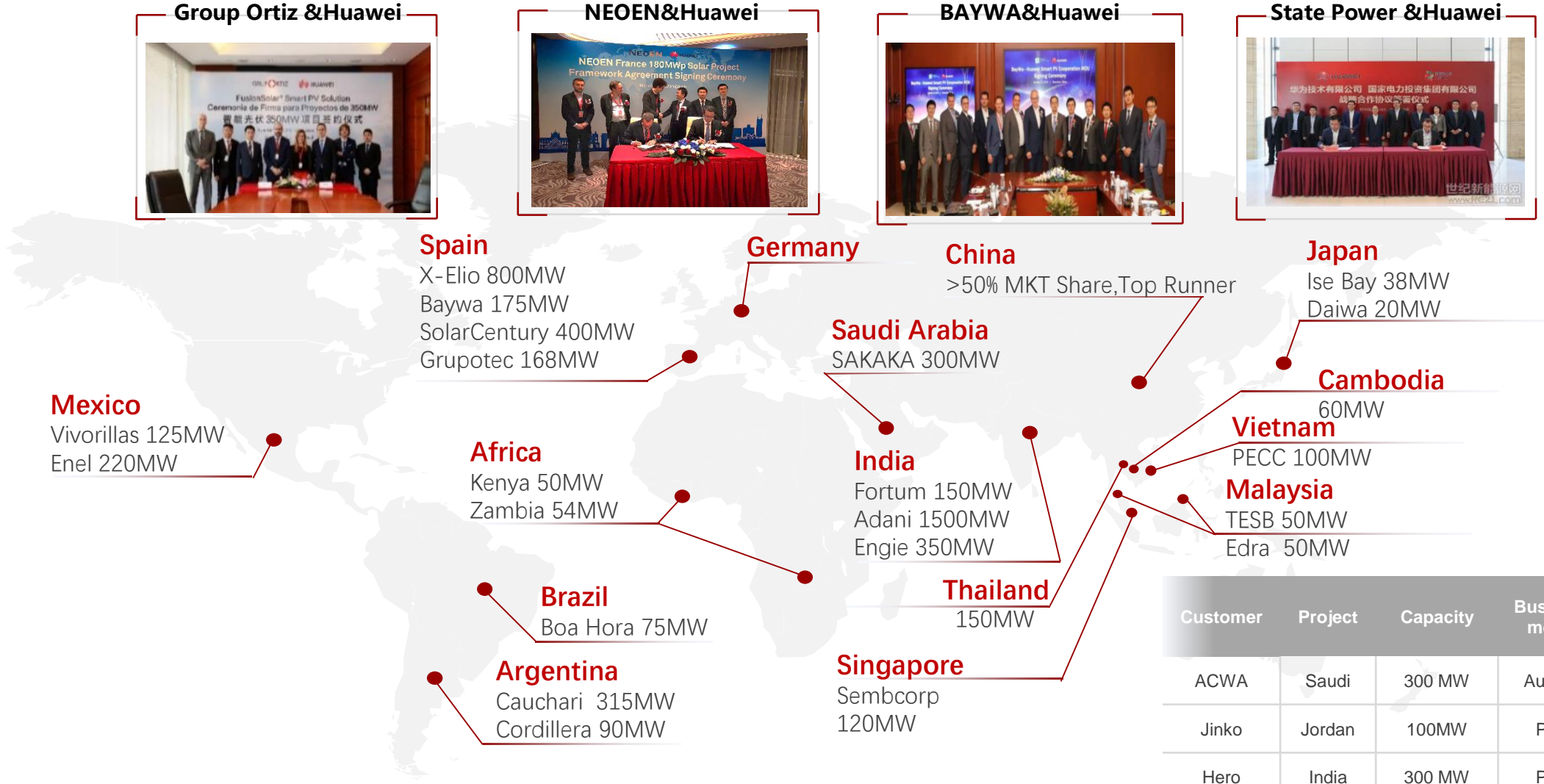
NEOEN & Huawei



BAYWA & Huawei



State Power & Huawei



Customer	Project	Capacity	Business model	Electricity Price (USD)
ACWA	Saudi	300 MW	Auction	2.4 cents
Jinko	Jordan	100MW	PPA	2.45 cents
Hero	India	300 MW	PPA	3.4 cents

Global Sales & Service, 3 Global Competence Center Sharing Huawei Solar Knowledge with More Partners

8 Mgt. Regional Team
Sales Team + Service Team

3 Global Competence Center
Solution Team



China India Japan Korea



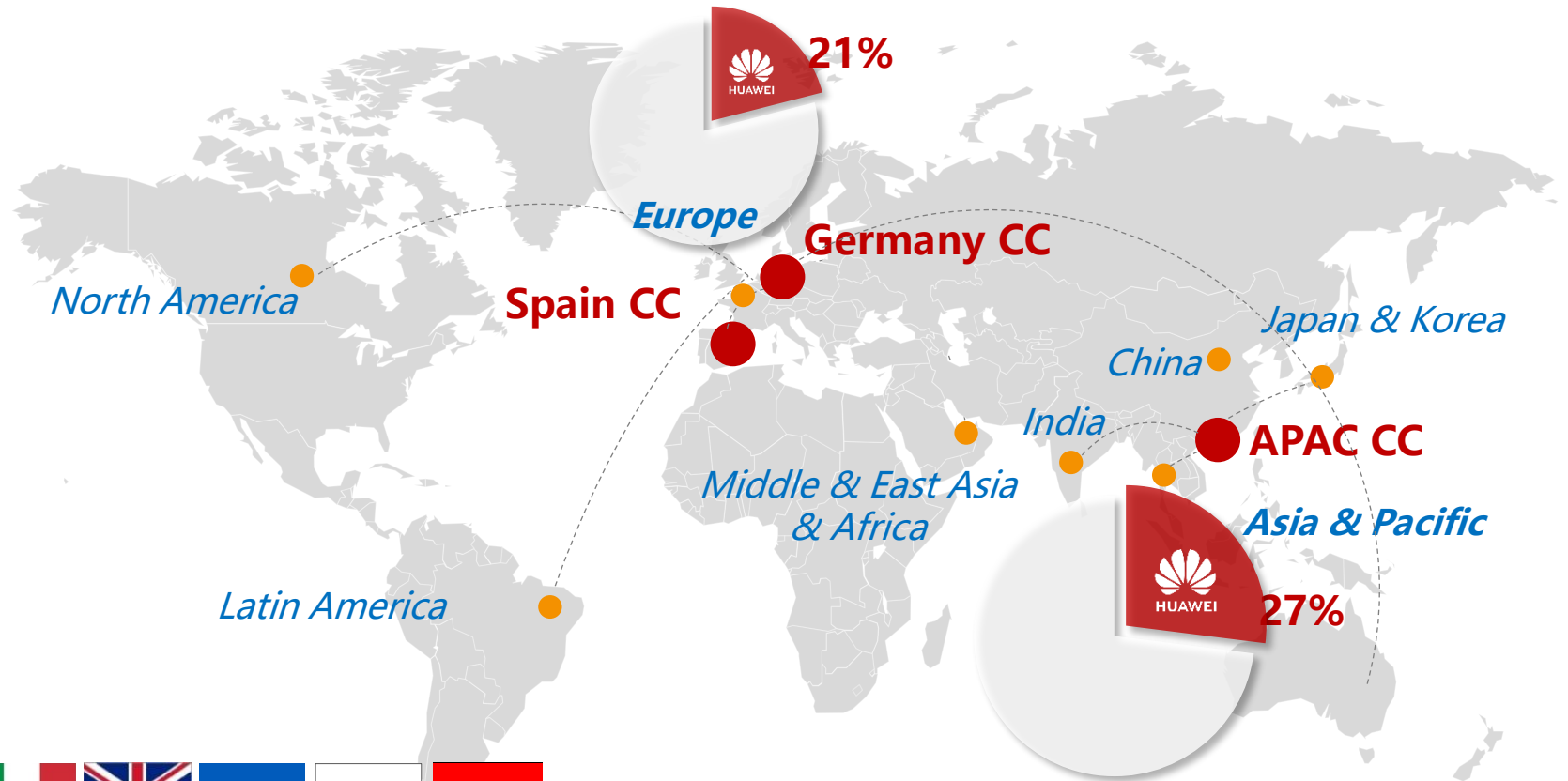
Mexico Brazil Argentina Chile



Thailand Malaysia Singapore Australia Vietnam



Spain German France Turkey Netherlands Italy UK Ukraine Poland Hungary



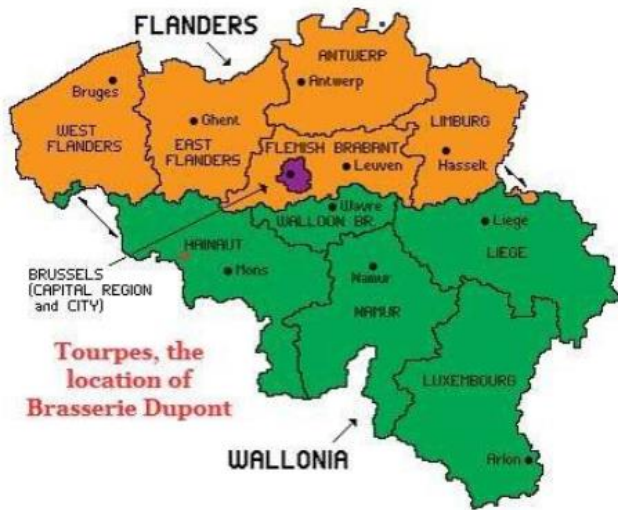
Dutch Key Projects & Customers Delivered more than 800MW



Built Top largest projects in NL



Belgium & Luxembourg Key Projects & Customers



Perpetum to build world's largest solar carport in Belgium

The 20 MW plant will feature 62,750 solar panels. Installer Perpetum Energy plans to commission the project in the spring of 2020.

AUGUST 19, 2019 CATHERINE ROLLET

UTILITY SCALE PV BELGIUM



A solar carport in France.

Eneco and ArcelorMittal unveil Belgium's largest solar roof

Employees of ArcelorMittal Belgium have the opportunity to invest in more than 27,000 solar panels at the Ghent site

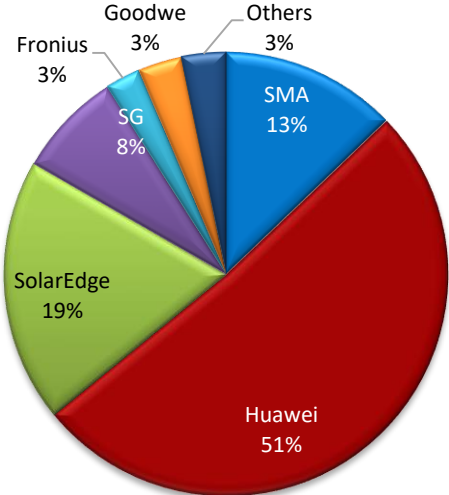


© RTL Archiv

Luxembourg's largest photovoltaic power station is made up of the RTL Group's transmitter sites in Junglinster and Beidweiler, where 23,415 solar panels were installed at the beginning of September.

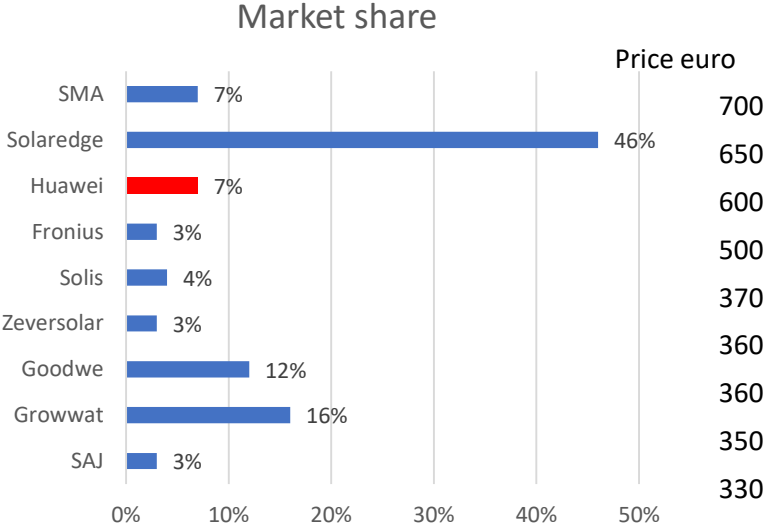


Netherlands Solar Market Insight



- Huawei had a strong position in the Commercial & Utility
- Huawei started to develop the residential in 2019 will gain more market share soon

Commercial&Utility Market share



Netherlands Residential

Netherlands Residential Market Capacity AROUND 90M\$	
Netherlands Residential Market Size in MW	450 MW(AC)
Average PV capacity per household	8 to 12 panels 3 KW(AC)
Netherlands Residential Market Size	150k units
Social Housing about 1/3 of total market - price sensitive market	~ 50K units
Collective PV Projects - example: Association of home owners	~ 25k units
Main competitor low end	Growatt
Main competitor High End	Solar Edge

Huawei FusionSolar Residential Smart PV Solutions

Huawei SUN2000 2-6KTL L1, The 1-Phase solution suitable for any scenario



Smart PV Optimizer
SUN2000-450W-P



Monitoring Portal
FusionSolar Cloud & APP



Smart Power Sensor
DTSU666-H 250A/50mA



Smart Dongle
Smart Dongle WLAN + FE
Smart Dongle-4G



Smart PV Inverter
SUN2000 2-6KTL-L1



Energy Storage
- Huawei Power Mate
- LG Chem

Simple Rooftop without Shading



Complex Rooftop with Shading or Higher Safety Required



Simple Inverter for Simple Roof Scenario

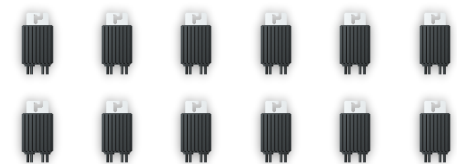


No Optimizer

Inverter with Full Optimizer for Complex Roof Scenario



Full Optimizer





One-Fits-All

Optimizer, Easier Business

One SUN2000-450W-P Optimizer:

- Simplifies business operating

PO & Stock management

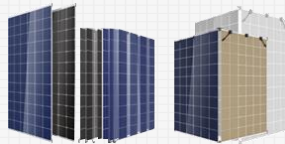


Service & Spare Part Management

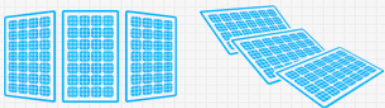


- Fits all 60 & 72 cell crystalline silicon PV modules with

- 450W rated input power
- 80V max input voltage

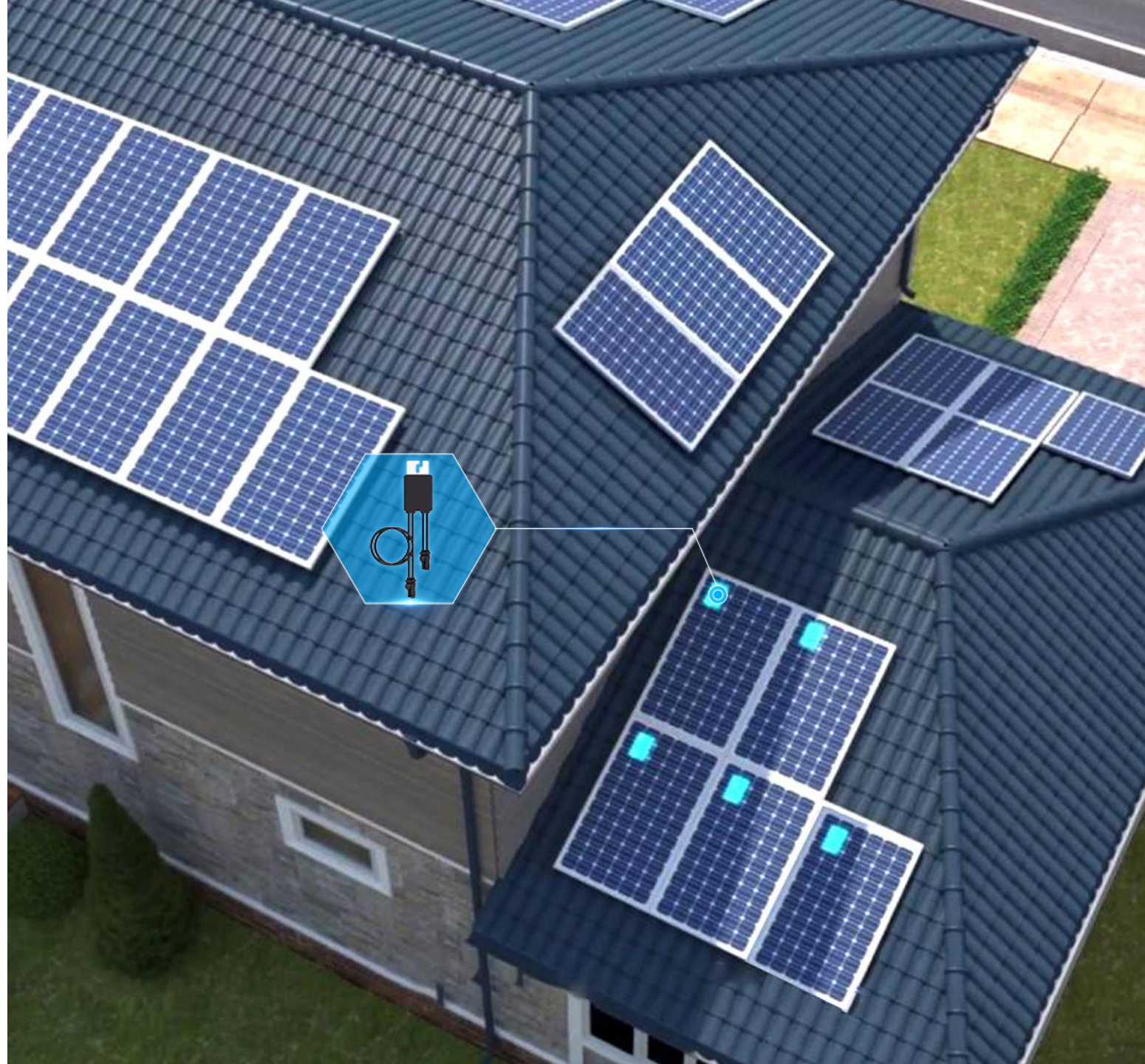


- Fits all PV module installation scenarios with



1.2m output cable suits module installed in

- Portrait and landscape
- Different azimuth and tile





Directly plug in battery, no additional device or any retrofit required



Less power loss due to high efficient charge and discharge



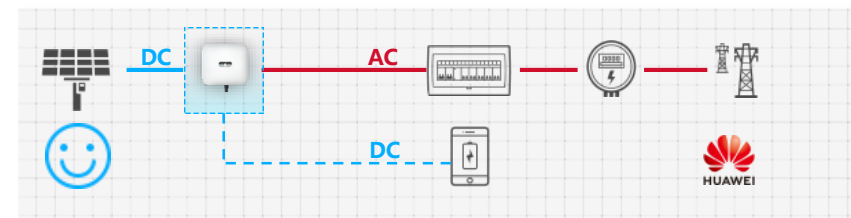
Battery ready, second sales opportunity on every inverter sold



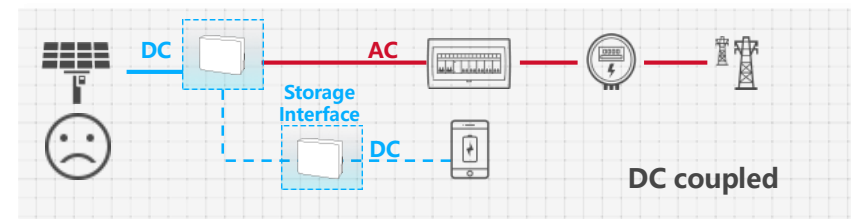
Battery Ready

Integrated battery Interface without additional device

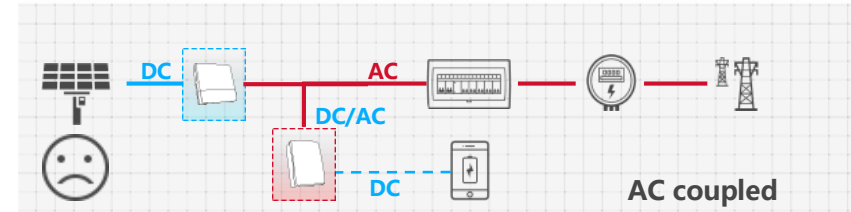
Battery ready system for a future battery add-on



Installation with storage interface for DC coupled system



Separated AC-coupled inverter raises conversion times resulting power loss



2x POWER

Battery Ready with More Energy

*Full optimizer long string design required

- ✓ A 5KTL-L1 inverter allows 5KW full power AC output plus 5KW full power battery charge.
- ✓ A 10KTL-M1 inverter allows 10kW full power AC output plus 10KW full power battery charge.



AI Powered AFCI to Proactively Mitigate Fire Risk



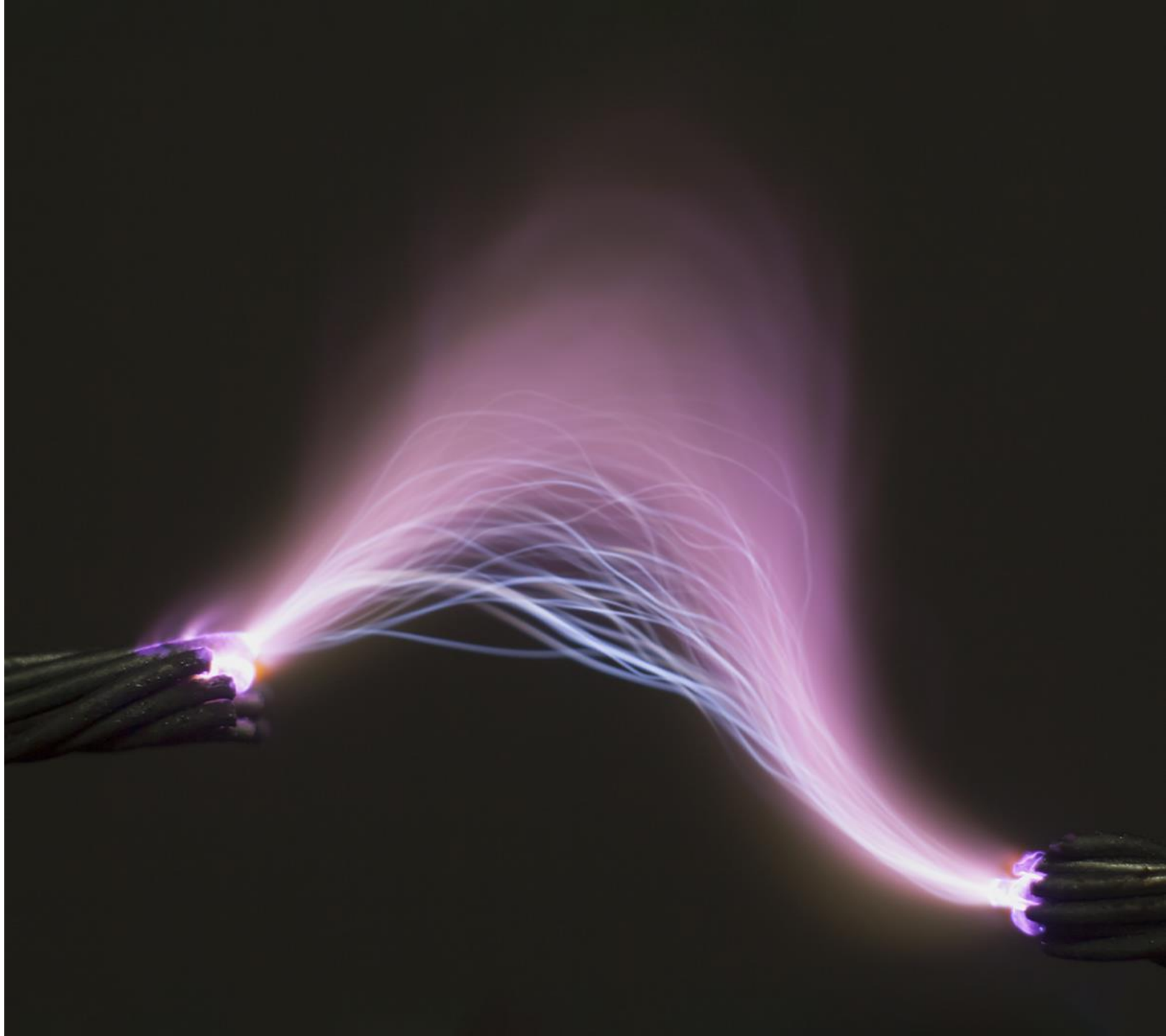
Automatic shutdown in <2sec meeting US UL1699B standard



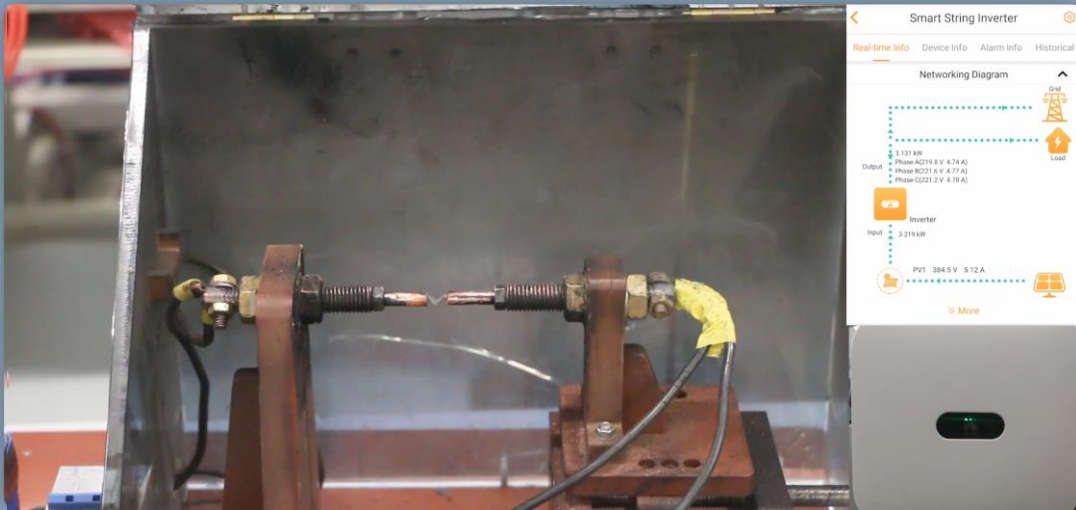
Accurately detect and confirm PV arcing with less false alarms



Support self-learning new types of arcing for future higher safety



AFCI disabled, arcing continuously posing fire risks



VS

AFCI function enabled, arcing extinguished in 400ms



PV Arcing with/without AFCI Comparison



Pinpoint

Arc Fault Positioning for Easier Troubleshooting



Saving 80% onsite troubleshooting time and cost with accurate arc fault positioning

* Manually detection of DC arc fault in a 10KWp residential system usually costs 5hrs. Pinpoint arc fault position report lead to resolve the problem within 30 mins.



Less power loss because of shorter system tripping

No Quick-wear Parts, Inverter Failure Rate < 0.5%



No LCD



No Button



Natural Cooling



Inverter failure rate < 0.5%

Station Phase II,
200 units, 963 running days
Failure Rate:
0.189%

Station Phase III,
4939 units, 583 running days
Failure Rate:
0.252%

Station Phase IV,
1790 units, 207 running days
Failure Rate:
0.390%



Huawei Residential Single-Phase & Three-Phase Portfolio



Smart Energy Center
SUN2000-2/3/3.68/4/4.6/5/6KTL-L1



Smart Energy Center
SUN2000-3/4/5/6/8/10KTL-M0

	SUN2000-2-6KTL-L1	SUN2000-3-10KTL-M0
AC output	Single Phase	Three Phase
MPPT/Inputs	2/2	2/2
Compatible with Huawei optimizer	SUN2000-450W-P	NA
Inverter-level arc fault circuit Interrupter (AFCI)	√	√
Built-in battery interface	LG Chem Huawei Power Mate (expected 2H 2020)	Huawei Power Mate (expected 2H 2020)
Remote Monitoring Communication	WLAN 2G/3G/4G (Optional) Fast Ethernet (Optional)	WLAN 2G/3G/4G (Optional) Fast Ethernet
Monitoring Portal FusionSolar Cloud & APP	√	√

Upgrade Your Solar Experience

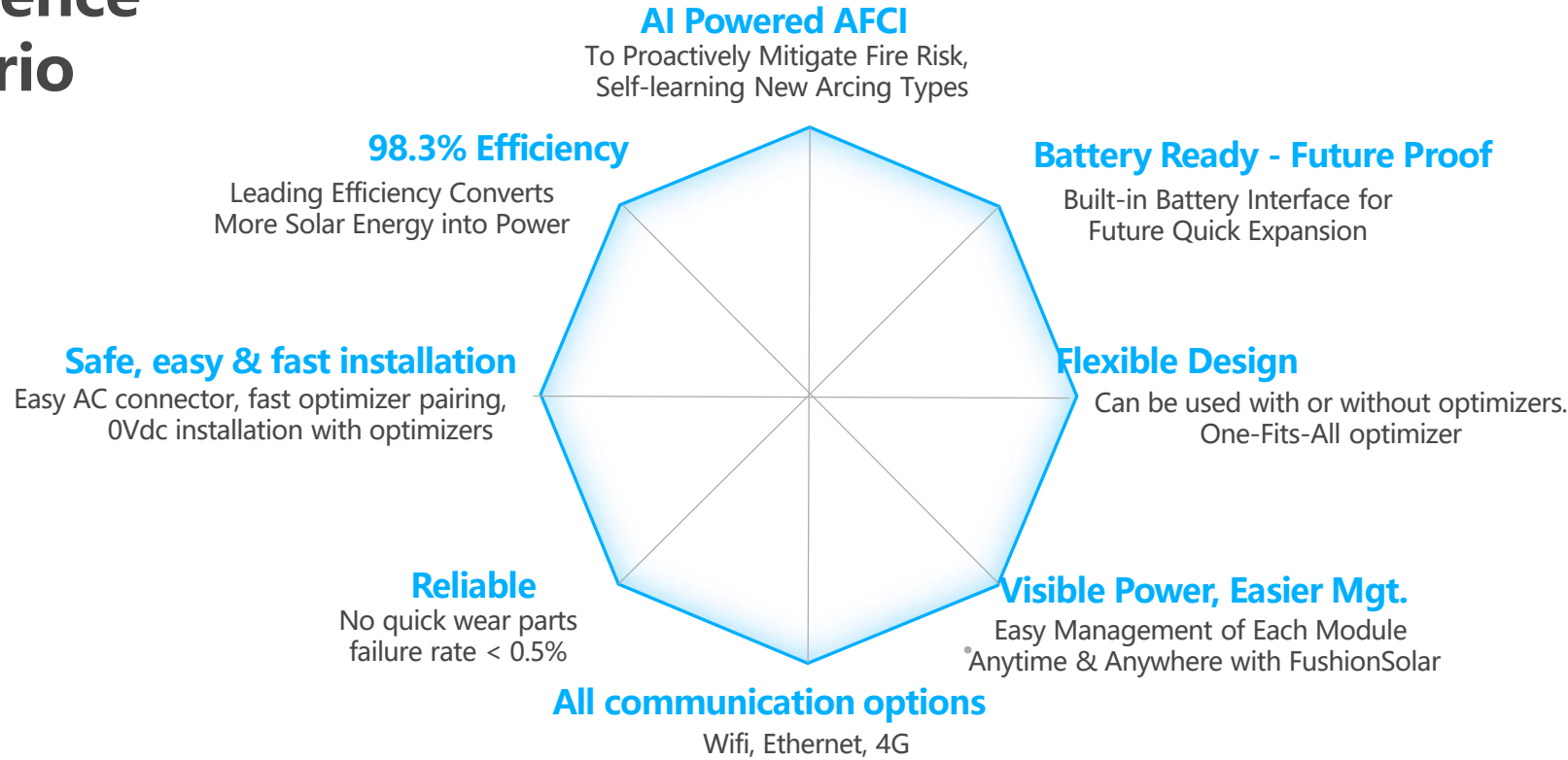
The inverter for any scenario



Smart Energy Center
SUN2000 2-6KTL-L1



Smart Energy Center
SUN2000 3-10KTL-M0



Open Discussion About Cooperation for solar business

Content



Huawei as a Sustainable Company

Huawei Solar Business

Dutch Solar Trend

Dutch Climate Agreement

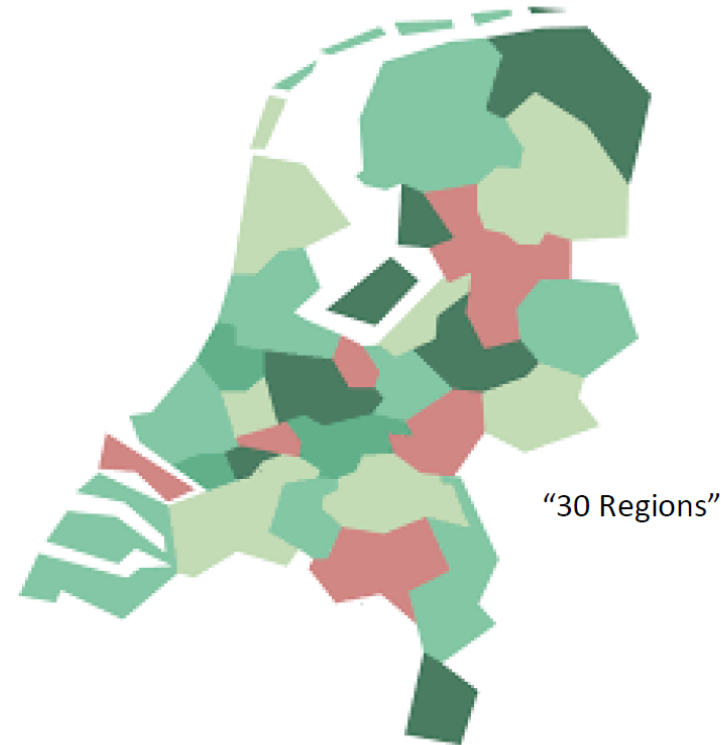
National Climate Agreement

- 49% reduction CO2 in 2030

Electricity goals 2030

20,2 CO2 Mton reduction

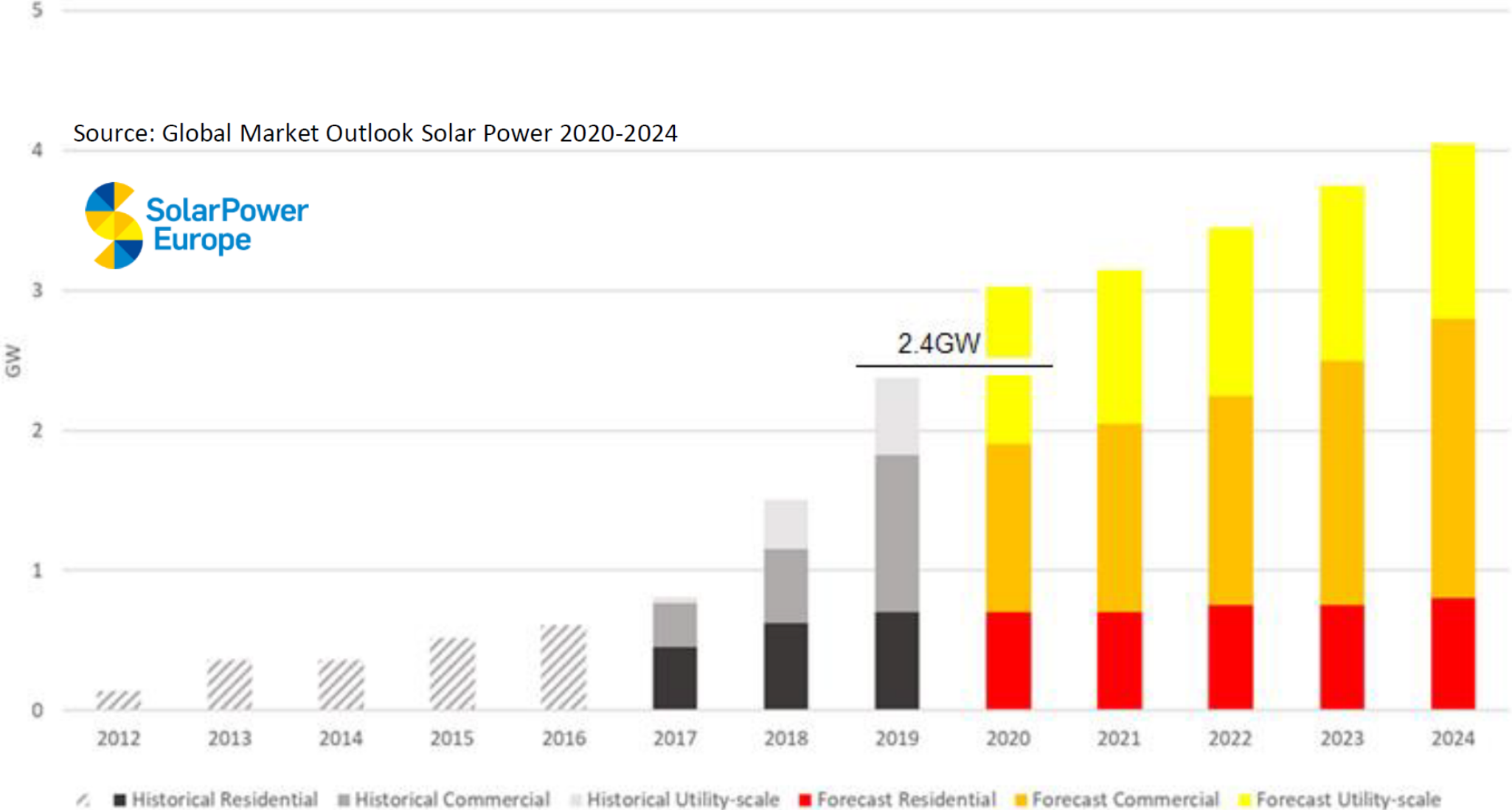
- 49 TWh offshore wind
- 35 TWh onshore wind+solar (> 15 kWp)
- 7 TWh residential
- 75% Solar + Wind in electricity mix 2030



www.klimaatakkoord.nl

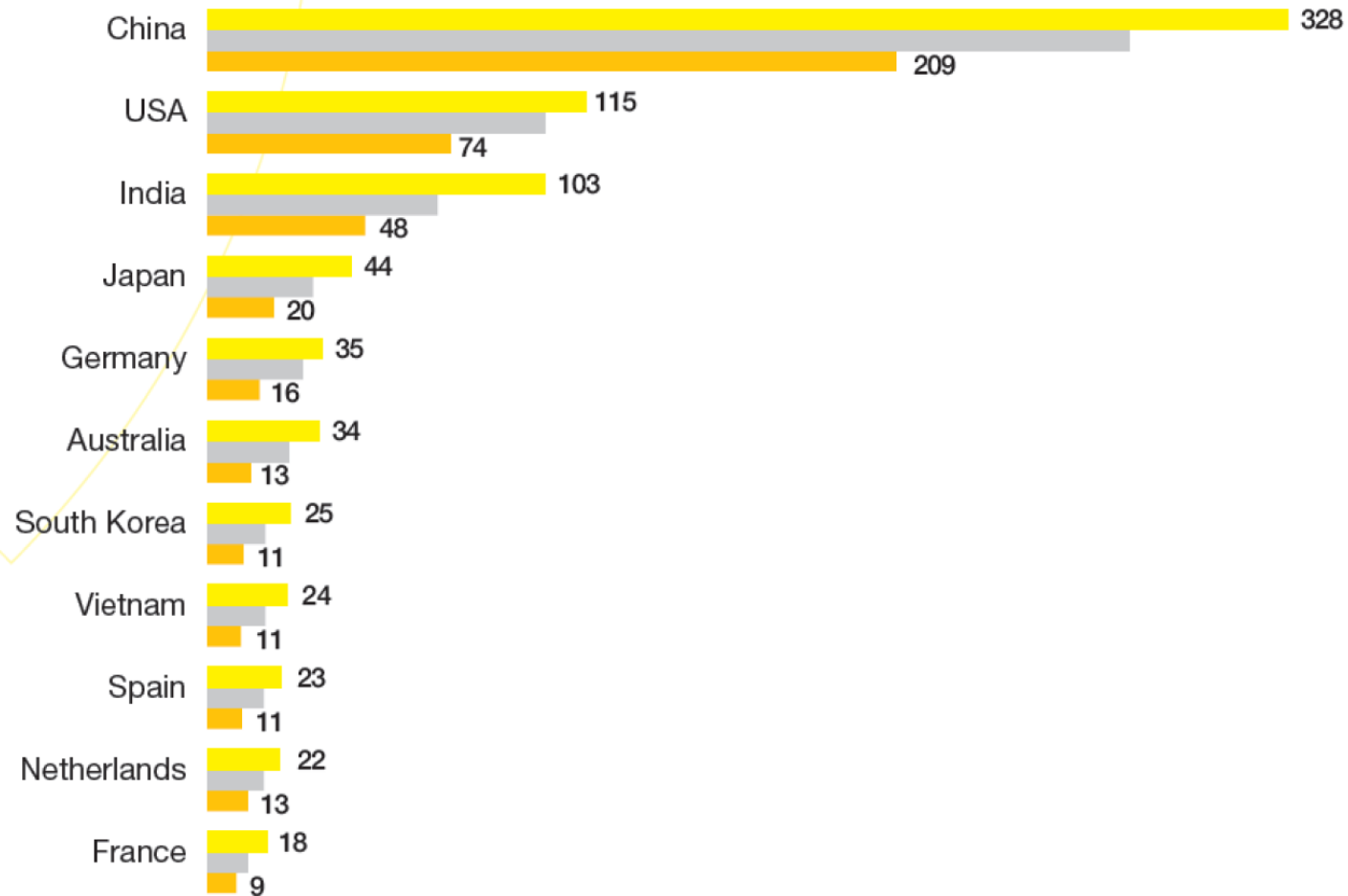
www.regionale-energiestrategie.nl

Netherlands Solar PV Market Scenarios 2020 - 2024



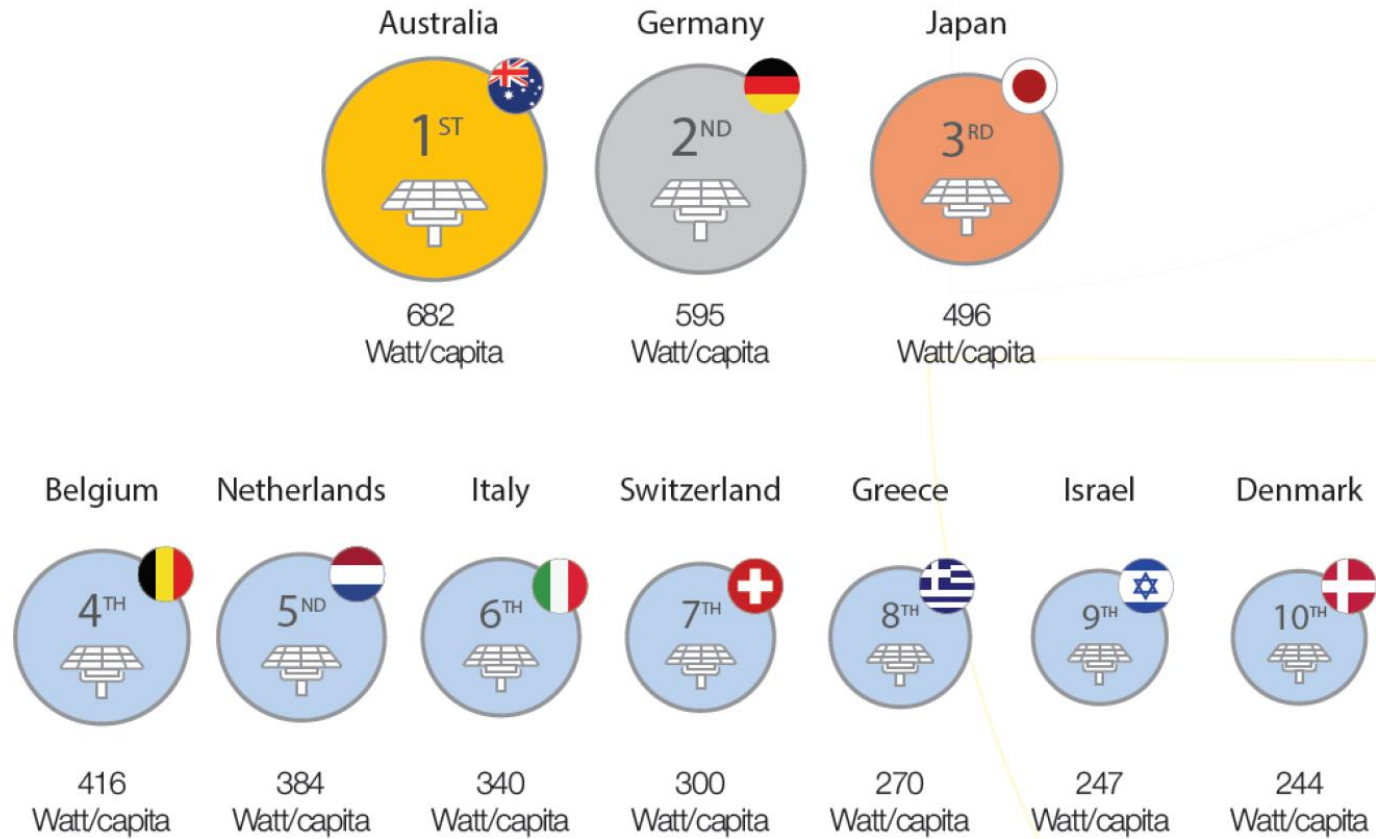
Total
24GWP
(2024)

FIGURE 17 TOP 20 MARKETS SOLAR PV ADDITIONS 2020-2024



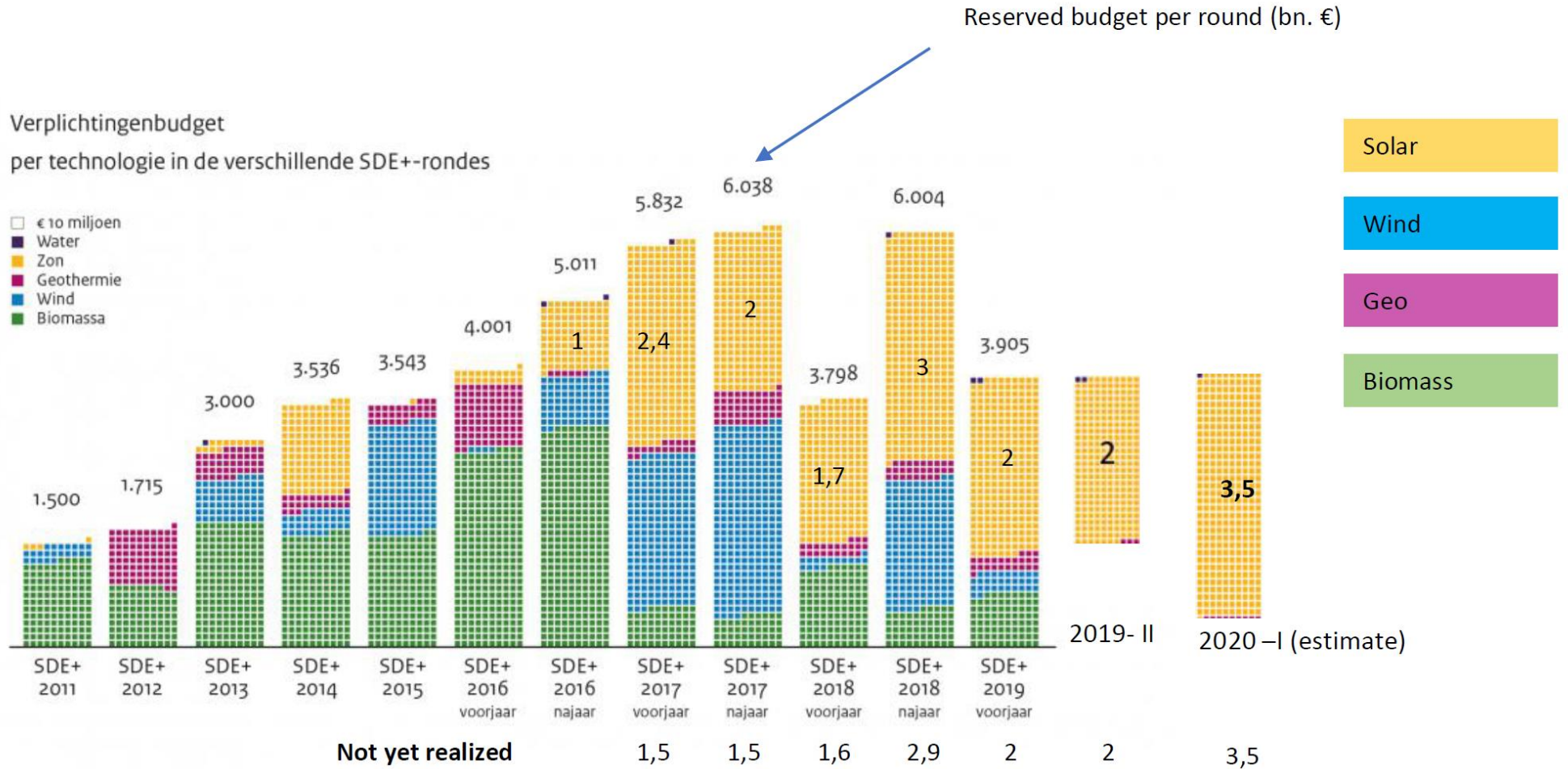
Global
Market
Outlook Solar
Power
2020

FIGURE 13 TOP 10 COUNTRIES SOLAR CAPACITY PER CAPITA 2019



Global
Market
Outlook
Solar Power
2020

SDE+ pipeline in GWp



Thank you.

Bring digital to every person, home and organization for a fully connected, intelligent world.

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