

Huawei Digital Power, Your Sustainable Partner For Building A Low Carbon Smart Society



HUAWEI

Pioneering innovation of digital and power electronics
Enabling smart renewable energy and accelerating carbon neutrality

Huawei: Leading provider of ICT infrastructure and smart devices



207,000 employees



55% employees work in R&D



170+ countries and regions



No. 5 in global R&D investment



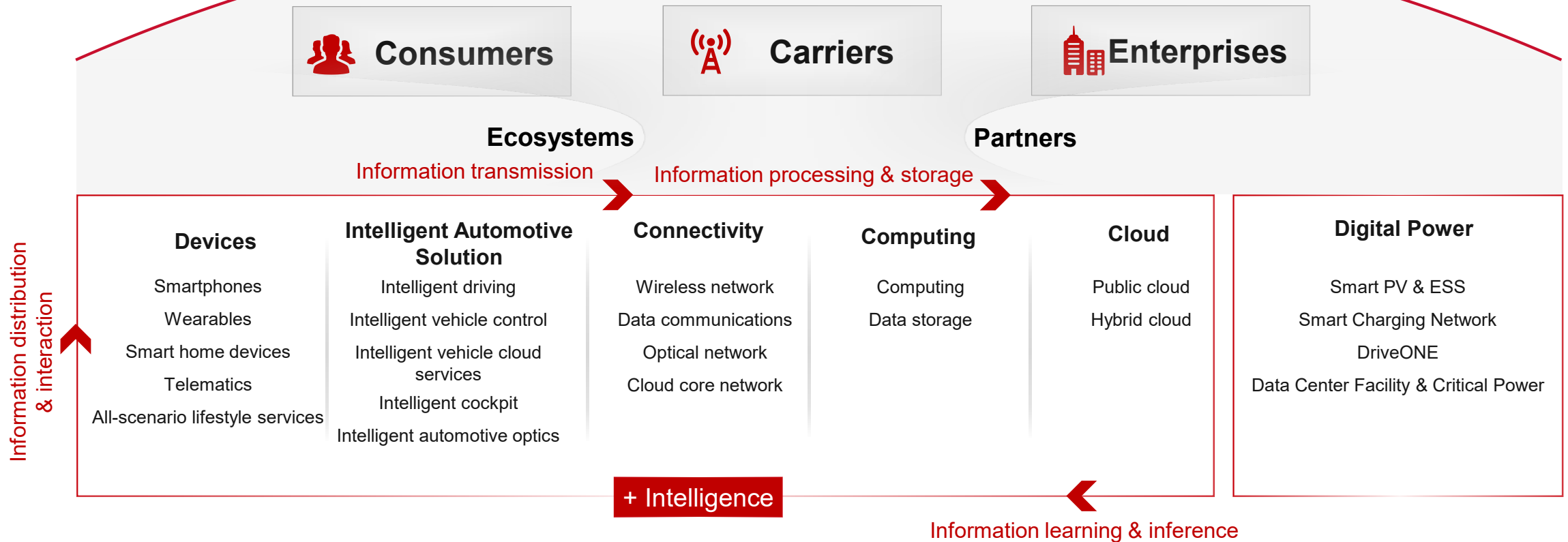
140,000+ active patents held globally

Vision & mission

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

Focusing on ICT to provide products, solutions, and services to three customer groups alongside ecosystems and partners

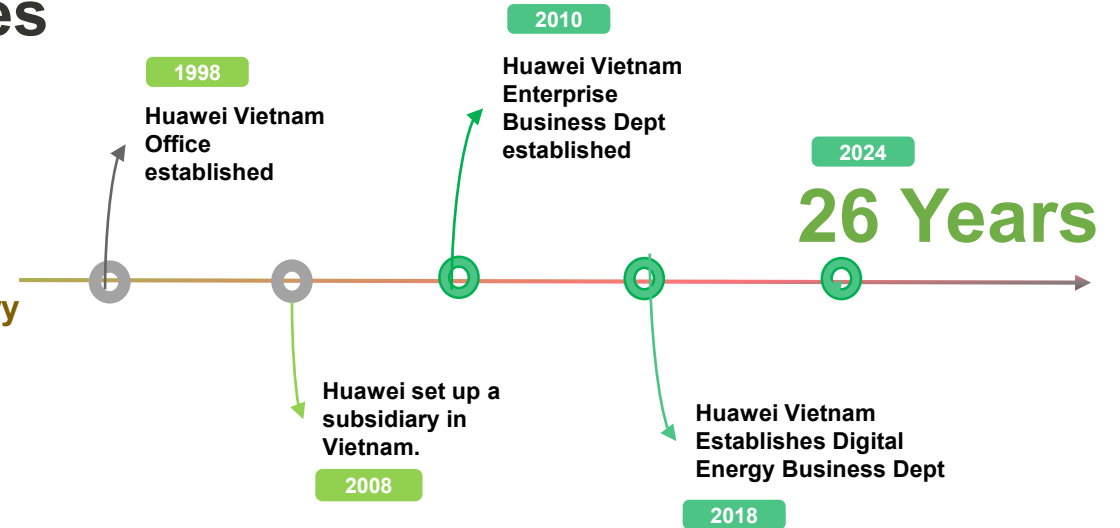
Bring digital to every person, home and organization for a fully connected, intelligent world



Huawei Vietnam Development Milestones



HUAWEI Development History



- Huawei offices are set up in Hanoi, Ho Chi Minh
- One service center in Da Nang.
- Huawei Vietnam has many excellent employees, and we do our best to be one of the best employers in Vietnam.
- Huawei has established close cooperation with all telecom operators in Vietnam. We provide end users with the best products, services, and solutions.

Our vision in Vietnam



Contributing to Vietnam's digital development



Contributing to business success of customers and partners



Enriching digital life and experiences

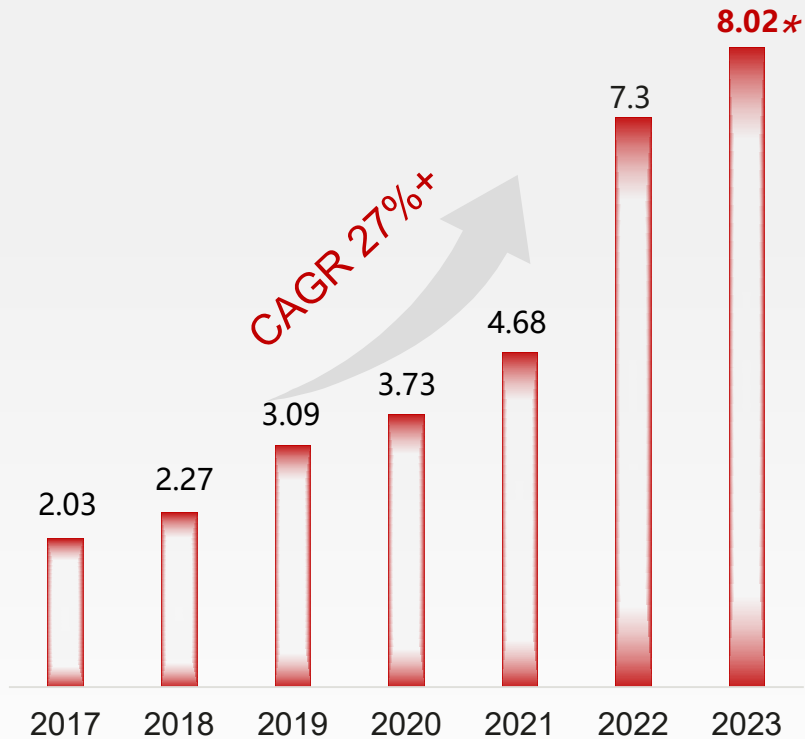


Cultivating more ICT talents

Steady growth of digital power businesses

Stable business growth

US\$ billion



**The estimated financial data is for reference only. The data released by Huawei at the end of March 2024 prevails.*

Integrating digital and power electronics technologies to promote green transformation in the industry



Smart PV: FusionSolar Grid-Forming Solution increasing renewables penetration by **40%**; inverters ranked **No. 1** globally by market share for 8 consecutive years

(Source: Wood Mackenzie)



Smart Charging Network: Fully liquid-cooled ultra-fast charging solution deployed in **50+** cities and along **20+** expressways including the G318 Highway



DriveONE: DriveONE eMobility solution adopted in **50+** vehicle models by **10+** automobile manufacturers



Data Center Facility & Critical Power: Modular UPS and FusionModule2000 ranked **No. 1** globally for 7 and 5 consecutive years respectively

(Source: Frost & Sullivan)



Site Power Facility: ranked **No. 1** globally by market share for 11 consecutive years

(Source: Frost & Sullivan)

FusionSolar Continuously **Building a Greener and Better Future Together with Our Global Customers**

450+ GW

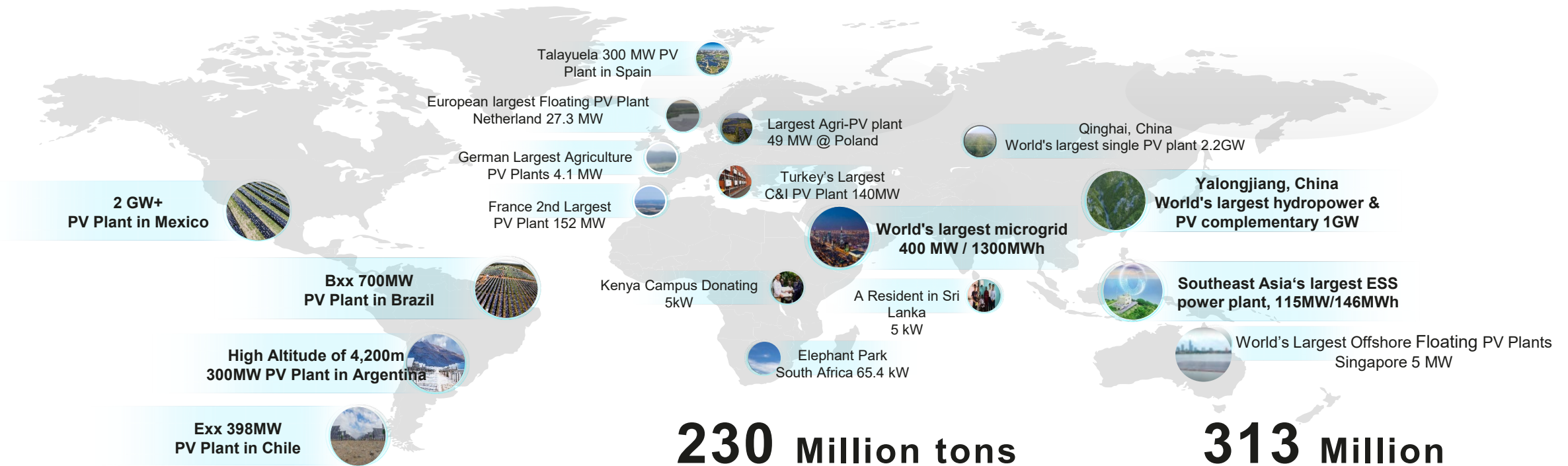
Inverter Shipment
Accumulated

150GW

String Inverter Shipment
2023, Estimated

15GWh

ESS Shipment
Accumulated



230 Million tons

Carbon Emissions Reduced

313 Million

Equivalent Trees Planted



“New Type Power System” for SEA, Accelerating Energy Independence and Carbon Neutrality

Energy Cloud

Power Generation

Transmission & Distribution

Energy Users



Smart PV + ESS Synchronous Generator
Grid Forming



Inverter + ESS + EV Charger + Optimizer
Self-consumption with 0-export



Inverter + ESS + EV Charger + Optimizer
24hrs Smart Green Living

Digital Power in Vietnam: Your Best Partner for a Better, Greener Future

2023 shipment
450MW, 50%
market share



7GW+

Inverter Accumulated Shipment



generate green power

8.52 Billion kWh/Year



reduce carbon emissions

3.93 Million tons/Year



equivalent to planting

5.37 Million trees/Year



Dong Nai, Viet Nam

6 MWp @ 2020

Ho Chi Minh City, Viet Nam

400 kW @ 2021

Note: Estimated data for each year after 2022

PROJECT TYPE	CAPACITY	PROJECT LOCATION	COD TIME
EASUP 831MWp	831 MWp	Dak Lak Province	2020
Gio Thanh 1&2 100MWp	100 MWp	Quang Tri Province	2020
Thien Tan 1.4 100MWp	100 MWp	Khanh Hoa Province	2020
Thien Tan 1.2&1.3 100MWp	100 MWp	Ninh Thuan Province	2020
Cat Hiep 50MWp	50 MWp	Bin Dinh Province	2020
Rooftop Project	3000 MW	Vietnam	COD 2019~2023



C&I Smart Energy Optimus Solution Accelerates the Green Power Transition

Smart PVMS



Optimizer

MERC-1100/1300W-P



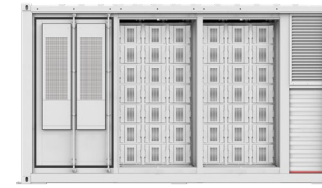
Inverter

SUN2000-100/115KTL-M2



Smart string ESS

LUNA2000



EV Charging Power Unit

Liquid cooled Power Unit

One-stop solution

- Better synergy & simple aftersales service

Active Safety

- Multi safety design for device, asset, personal safety

High Reliability

- Supports on-grid and off-grid scenario, provide stable power to C&I owners

More Revenue

- Pack-level optimization to provide 5% more energy

Smart O&M

- Automatic SOC calibration of the ESS, free of site visits

The only Optimizer+Inverter+ESS+Charger+Load+Cloud solution provider, providing one-stop home energy management



Optimal Electricity Cost

Active Safety

Better Experience

One-fits-all

One supplier for all products
Optimizer+Inverter+ESS+Charger+Load+Cloud

One solution for all scenarios

On-Grid
Off-Grid

One inverter adapts to the on/off-grid scenario.

One optimizer for all modules in the market (166/182/210, etc.)

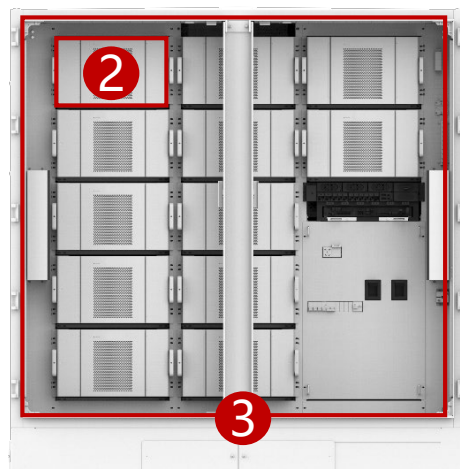
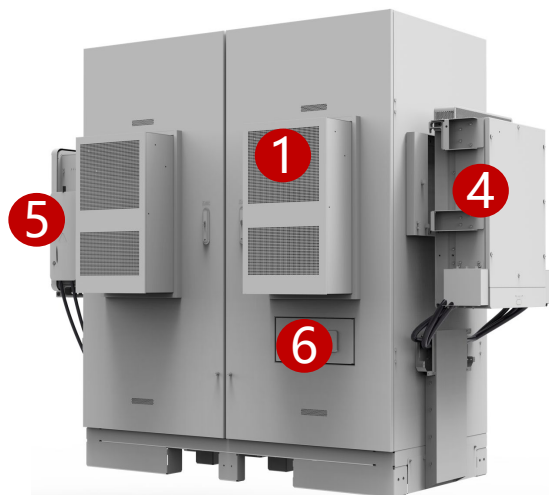
One ESS for 1-/3- phase inverters

One app for all functions.

One service window for all customers

Middle & Small C&I Scenario, LUNA2000-97/129/161/200KWH

Flexible Capacity Adapting to different C&I ESS scenarios

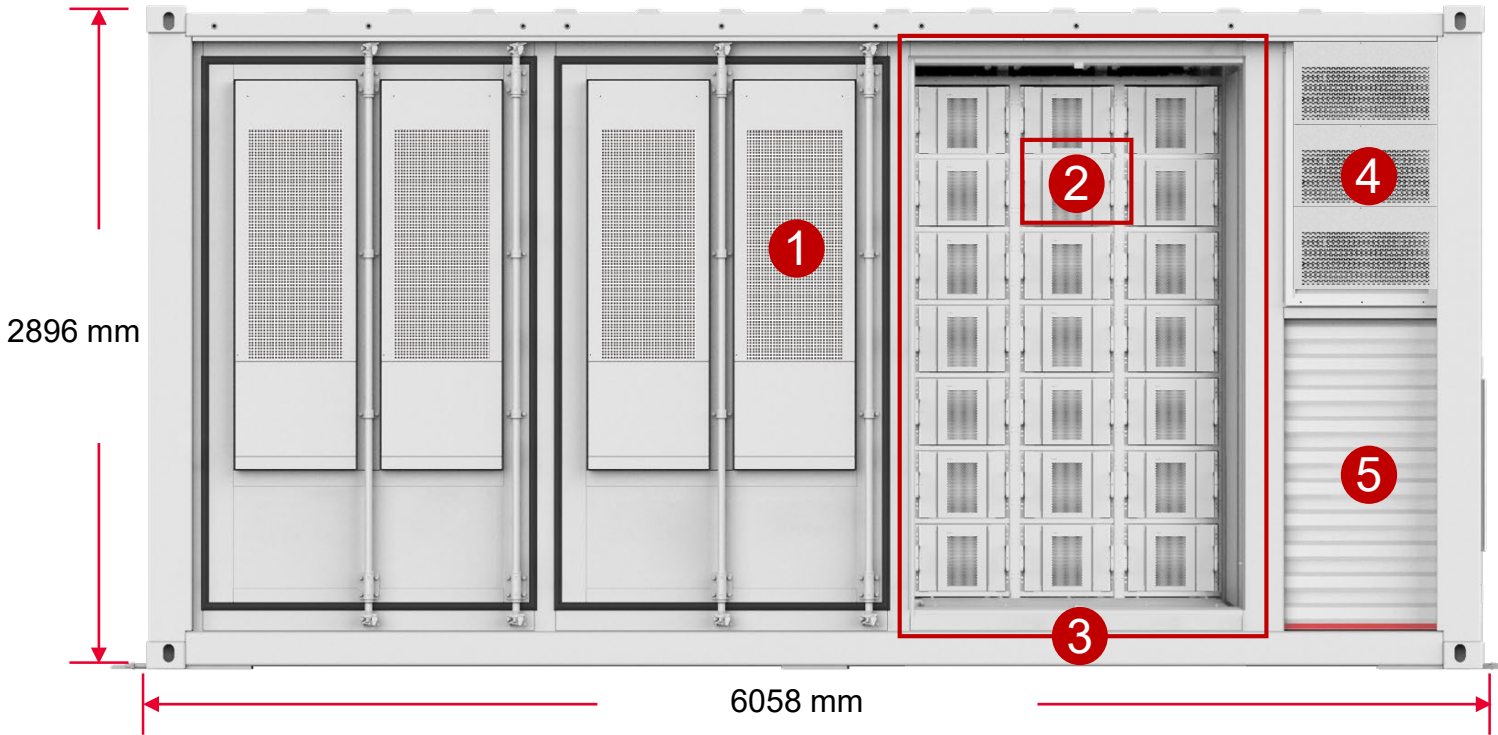


- 1-Door-mounted distributed air conditioners
- 2-Battery pack (integrate optimizer)
- 3-Battery rack
- 4-Smart Rack Controller
- 5-PCS
- 6-Abort button

ESS model	ESS capacity (1 cabinet)	Quantity of battery pack	Max. charge/discharge rate	Parallel use
LUNA2000-97KWH-1H1	96.8kWh	6	1C	<ul style="list-style-type: none"> • Different capacity models can be used together (Max. 20) • Capacity range: 96.8~3870 KWh
LUNA2000-129KWH-2H1	129.0kWh	8	0.8C	
LUNA2000-161KWH-2H1	161.3kWh	10	0.64C	
LUNA2000-200KWH-2H1	193.5kWh	12	0.5C	

*The battery pack of 97/129/161KWh is different from that of the 200kWh ESS, only the dimension is the same

Large C&I Scenario, LUNA2000-2.0MWH-1H1/2H1/4H1



1 • **Distributed air conditioners**
6 for each LUNA2000-2.0MWH-1H1

2 • **Battery pack and battery optimizer**
18 pcs 280 Ah cells in a battery pack
Built-in battery pack optimizer

3 • **Battery rack**
Each battery rack contains 21 battery packs.
Each ESS contains 6 battery racks.

4 • **Smart Rack Controller**
* 3 rack controllers in LUNA2000-2.0MWH-4H1/2H1
* 6 rack controllers in LUNA2000-2.0MWH-1H1

5 • **Control unit cabin**
Power distribution and fire suppression systems

20-ft ESS container

LFP battery

Capacity 2032 kWh

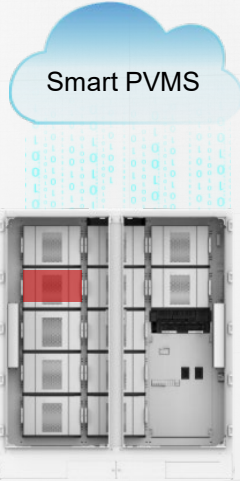
Weight < 30 t

Multi Active Safety Ultimate Safety for ESS, Asset & Personal

ESS Safety

Pre-warning of risk

- Battery cell test: Huawei 100+ VS Others 20+
- Real-time monitoring of battery cell
- Active shutdown of faulty battery through optimizer in over current & voltage scenario



Asset Safety

Active fire extinguishing

- Temperature/Smoke/CO sensors + fire extinguishing module: fire extinguishing in early phase



Personal Safety

"Safety airbag" design

- Release pressure in top direction instead of front blast release, avoid personal injury in extreme scenario



Service safety: professional installation & maintenance ensure safe operation

Qinghai Santara utility-scale PV project

Huawei FusionSolar Smart PV in the world's largest PV plant

Total capacity **2.2 GW**, including 1.6 GW
of Huawei inverters.

Grid forming – stable operation in
all-scenario grid scenarios (SCR down to 1.2)

Safe & reliable –
availability \geq **99.999%**

Uses the SUN2000-175KTL-H0 inverters, connected to grid on
September 30, 2020

* Hainan Prefecture

The world's first UHV power line that delivers 100% renewable energy over long
distances

The world's largest renewable energy project with the shortest construction time





Red Sea project, Saudi
Arabia, Middle East

World's first GW-level
grid forming PV+ESS plant
construction

Total plant capacity: **400 MW** PV +
1.3 GWh ESS

Provide **100%** renewable energy for **1 million**
people

800 MWh has been running stably since July 2023 and the project is expected to put into full operation by the end of 2023.



Largest energy storage project
in Southeast Asia

Singapore Sembcorp ESS (spinning reserve + frequency regulation)

Plant capacity of **115 MW/146 MWh**

Rack-level management and **longer-lasting constant power output** for more benefits of frequency regulation

Automatic SOC calibration greatly reducing O&M costs

High reliability, meeting strict local standards and receiving CoC in fire protection capabilities and complied with EN ISO 1182 and EN ISO 1716

Digital Power: Your Best Partner for a Better, Greener Future

By December, 2023, Huawei Digital Power has helped customers

generate green power

997.9 billion kWh

save power

46.1 billion kWh

reduce carbon emissions

495 million tons

equivalent to planting

680 million trees



Conversion note:

Note 1: Conversion coefficient of electricity carbon emissions – 1 kWh electricity is equivalent to 475 g CO₂ (global average).
Source: IEA Global Energy & CO₂ Status Report 2018

Note 2: Lifetime CO₂ absorption of trees (equivalent number of planted trees) – A tree absorbs 18.3 kg of CO₂ a year, and each tree has a 40-year lifespan.
Source: Open data of the North Carolina State University website

Thank you.

把数字世界带入每个人、每个家庭、
每个组织，构建万物互联的智能世界。

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

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