



# PLANNANO BROCHURE

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PLANNANO ENERGY  
PULAN ENERGY STORAGE  
SEMITECH

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\* All products can be customized according to clients' needs.

\* The product images and specifications displayed in this manual are for reference only. Please refer to the product specifications for detailed parameters.

THE LEADER IN DRY ELECTRODE AND SAFE ENERGY STORAGE

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## **Product Introduction**

- Powder Materials
- Dry Electrode
- LTO Battery
- Super Capacitor
- Portable Power Station
- Home Energy Storage system
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- Large-scale Energy Storage
- Smart Charging Pile

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## **Industry Applications**

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## **Global Services**

- Partners
- Business Distribution

As the global leader in dry electrodes and safe energy storage system, Plannano will utilize dry electrodes and LTO battery as the foundation, all-solid-state batteries as the breakthrough, to accelerate green development and set sail for a zero-carbon future.

200<sup>+</sup>  
CUSTOMERS

100<sup>+</sup>  
COMPANY

# 01 COMPANY PROFILE

THE LEADER IN  
DRY ELECTRODE AND SAFE ENERGY STORAGE

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PLANNANO

# ABOUT PLANNANO



Tianjin Plannano Technology Co., Ltd. was co-founded in 2009 by internationally renowned nanomaterials experts, Professor Chen Yongsheng of Nankai University and Mr. Xie Minyu. Plannano has 3 wholly-owned subsidiaries: Plannao Energy, Pulan Energy Storage and SEMITECH. Our company is committed to the development and application of new nanomaterials in the field of new energy, and has four core technologies: dry electrode preparation, in-situ preparation of LTO material and all-tab battery preparation, module and system integration and all-solid-state lithium-ion and lithium-metal battery. In the fields of graphene, dry electrode, all-tab LTO battery, and energy storage system, Plannano has outstanding technical advantages and rich technique experience.

The company has a 40,000-square-meter manufacturing plant and more than 600 employees, with more than 60 doctoral/master's degrees and more than 300 undergraduate/junior college degrees. The company owns a whole industrial chain from materials, electrodes, cells, modules to systems, and has formed main products six categories, including materials, dry electrodes, supercapacitors, LTO batteries, home energy storage and portable power station, and large-scale energy storage systems. The products are exported to more than 50 countries and regions across six continents, including Asia, Europe, North America, South America, Oceania, and Africa, and are widely praised by customers.



PLANNANO ENERGY  
Annual Capacity: 100MWh, 1500000m<sup>2</sup>



PULAN ENERGY STORAGE  
Annual Capacity: 3GWh



SEMITECH  
Annual Capacity: 5GWh

 <p><b>15+</b> YEARS R&amp;D AND MANUFACTURING EXPERIENCE</p>	 <p><b>2</b> MANUFACTURING CENTER Tianjin, Luoyang</p>	 <p><b>4</b> SALES CENTER &amp; OVERSEAS WAREHOUSE Tianjin, Shenzhen, California, Hanburg</p>
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# DEVELOPMENT HISTORY

- **2009** Tianjin Plannano Technology Co., Ltd. established, successfully developed graphene, LTO materials, and dry capacitor electrode etc.
- **2015** Tianjin Plannano Energy Technology Co., Ltd. established  
Started the construction of mass production lines for dry supercapacitor electrodes and LTO materials
- **2016** Mass sale of dry supercapacitor electrodes, supplied to internationally renowned capacitor manufacturers  
Successful development of all-tab LTO battery, winning the honor of Tianjin Key New Product

- **2017** Successful mass production of LTO material  
Successful mass production of all-tab LTO battery  
IATF16949, ISO9001, ISO14001 certified  
National High-tech Enterprise  
Top 10 enterprises in China's supercapacitor industry
- **2018** Mass production of supercapacitors  
LTO battery with high energy density was successfully developed  
The first batch of leading enterprises in Tianjin's strategic emerging industries

- **2019** The All-tab LTO battery has obtained the national automotive battery certification  
The All-tab LTO battery system was successfully mass-produced  
The supercapacitor module was successfully mass-produced  
Tianjin Patent Excellence Award  
National Intellectual Property Advantage Enterprise
- **2020** All-tab LTO battery is promoted to the world  
Small LTO battery was successfully developed and mass-produced  
Excellence Award of the 2020 National Innovation and Entrepreneurship Competition
- **2021** All-tab LTO battery has been successfully applied to off-grid energy storage system  
High-energy and ultra-safe low-temperature batteries were successfully developed  
Obtained ISO45001 certification and integration of Informationization and industrialization management system certification  
The third batch of national-level specialized, special and new little giants

- **2022** Small LTO battery is promoted to the world  
Large-scale energy storage system was successfully mass-produced  
The dry process battery was successfully trial-produced  
Construction of the third plant  
Tianjin Postdoctoral Innovation Practice Base  
Tianjin Gazelle Enterprise
- **2023** Mass application of supercapacitors to frequency modulation in ESS  
Successfully trial production of all-solid-state battery and dry battery electrodes  
Wining the honor of Tianjin Enterprise Technology Center  
The third plant was put into use, annual capacity more than 100MWh  
Pulan Energy Storage (the fourth plant ) Established and put into use, annual capacity more than 3GWh  
Merger and acquisition of Henan SEMITECH, annual capacity more than 5GWh

# HONORS & CERTIFICATIONS

Plannano has accumulated more than 40 licensing patents, won more than 20 honorary titles such as National Little Giant Enterprise with High Market Share and Strong Innovation Capacity, National High-tech Enterprise, Tianjin Enterprise Technology Center, etc., and passed "IATF16949", "ISO14001", "ISO45001", "integration of industrialization and industrialization management system certification". Plannano aims to promote Made in China to the world.



**14**  
Licensing Invention Patents

**30**  
Licensing Utility Model Patents

**≥ 7%**  
R&D Expense Proportion

**6**  
Participate in Standard Development

## 02 PRODUCT INTRODUCTION

THE LEADER IN DRY ELECTRODE AND SAFE ENERGY STORAGE

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# POWDER MATERIALS

## GRAPHENE

### PRODUCT DETAILS

With stable two-dimensional honeycomb lattice structure, graphene has excellent performance, and it is considered to be a revolutionary material in the future and has become a hot spot in materials science research. Plannano's graphene products are suitable for the preparation of conductive films, drug carriers, composite materials, and various electronic and optical circuit components.



**Thermal Properties**

The thermal conductivity is up to 5000 W/m·K, 3 times that of pure diamond at room temperature, 12 times that of metallic copper;

**Mechanical Properties**

The strength is up to 130GPa, with good toughness, which can be stretched to 120% of its own size;

**Electromagnetic Properties**

The electron transmission speed can reach 1/300 of the light speed, with special properties such as quantum Hall effect and ferromagnetism;

**High Light Transmittance**

The photon transmittance is up to 97.4%, and its theoretical specific surface area is up to 2630 m<sup>2</sup>/g.

### SPECIFICATIONS

PRODUCT NAME	PRODUCT MODEL	PRODUCT SPECIFICATIONS
Single-layer graphene oxide	Sgraphene-001	Solid powder, purity >99%, thickness 0.7-1.2nm, excellent solubility in water and DMF, etc., metal content < 10ppm, insoluble impurities < 0.01%.
Single-layer graphene	Sgraphene-002	Solid powder, purity >99%, layer thickness 0.7-1.2nm, metal content < 10ppm
Aqueous solution of single-layer graphene oxide	Sgraphene-010	The concentration is 2mg/ml, and the thickness is 0.7-1.2nm, which ensures the solution is stable for more than one year.
Aqueous solution of single-layer graphene	Sgraphene-030	The concentration is 1mg/ml, and the thickness is 0.7-1.2nm, which ensures the solution is stable for more than one year.
Few-layer graphene	Sgraphene-070	Solid powder, purity > 99%, 85% is 2-4 layers, thickness 1-3nm, excellent solubility in water and DMF, etc., metal content < 10ppm, insoluble impurities < 0.01%

## LTO MATERIALS

### PRODUCT DETAILS

LTO material is a spinel-type material with a stable and dense structure, and is one of the most promising anode materials for lithium batteries. After graphene modification and micro-nano structure design, its surface activity and gas generation are reduced to ensure long life at high temperature.



**High Safety**

No dendrites, good thermal stability;

**High Rate**

High lithium-ion diffusion coefficient (2 \*10<sup>-8</sup> cm<sup>2</sup>/s), charging rate can reach more than 10C;

**Long Cycle Life**

Zero strain, stable structure;

**Wide Working Temperature Range**

It can be charged and discharged normally between -50°C-65°C.

### SPECIFICATIONS

PRODUCT MODEL	LTO-G2
Tap density (g/cm <sup>3</sup> )	1.3±0.3
pH	10.5±0.5
Specific surface area (m <sup>2</sup> /g)	3.5±0.5
Particle size distribution D50 (μm)	13±3
0.5C reversible capacity (mAh/g)	≥163
1st efficiency (%)	≥95








# DRY ELECTRODE



## DRY CAPACITIVE ELECTRODE

### PRODUCT DETAILS

Based on independent intellectual property rights and solvent-free processing technology, the dry electrode has the characteristics of low moisture content, high compaction density, large storage capacitance, high power density, long cycle life, low self-discharge rate, high temperature and high humidity resistance. The performance is at the international leading level, and the cost is lower than that of wet electrode.

-  **Cycle life**  
Improve 100%;
-  **Working temperature**  
Can be expanded to -55~+85°C;
-  **Power density**  
Improve 35%;
-  **Working humidity**  
Up to 85%;
-  **Energy density**  
Improve 30%;
-  **Green and environmental protection**  
No VOC emission;
-  **Covered area**  
Decrease 70%.

### SPECIFICATIONS

PRODUCT MODEL	PL-AAS-23400-250	PL-AAD-22900-135	PL-ABS-22900-235
Series	AA Series		AB Series
Electrode type	High Cycle Life Double faces coated	High Cycle Life Single face coated	High Cycle Life Double faces coated
Total width (mm)	234	229	229
Width of the coated area (mm)	234	229	229
Width of the tab (mm)	0	0	0
Thickness of the electrode (μm)	250	135	235
Capacitance of the double-layer capacitor for reference (F/m <sup>2</sup> )	≥15200	≥7600	≥18000

PRODUCT MODEL	PL-AES-23400-250	PL-AES-11015-250	PL-PQS-04307-250
Series	AE Series		PQ Series
Electrode type	High Cycle Life Double faces coated	High Cycle Life Double faces coated	High Cycle Life Double faces coated
Total width (mm)	234	125	50
Width of the coated area (mm)	234	110	43
Width of the tab (mm)	0	15	7
Thickness of the electrode (μm)	250	250	250
Capacitance of the double-layer capacitor for reference (F/m <sup>2</sup> )	≥15200	≥15200	≥13600








# LTO BATTERY



## PRODUCT DETAILS

Based on the LTO material technology and high energy density cell technology with independent intellectual property rights, Plannano took the lead in solving the industry problem of gas generation at high-temperature of LTO battery, and has developed products with excellent performance and cost effectiveness. Advanced technology, simple process and low cost.

-  **High safety**  
No dendrite, good thermal stability, intrinsic safety;
-  **Long cycle life**  
More than 20 years;
-  **High rate**  
Fully charged in 6 min, completely discharged in 6 min;
-  **Wide Working temperature**  
Can be charged and discharged repeatedly at -50~65 °C;
-  **Recycle**  
Recycling rate of the cell > 97%.

## C SERIES

### SPECIFICATIONS

PRODUCT MODEL	PLITR18650CA-1500mAh-2.4V	PLITR18650CB-1500mAh-2.4V	
Nominal capacity (Ah)	1.5	1.5	
Nominal voltage (V)	2.4	2.4	
Charging and discharging voltage range (V)	1.5~2.7	1.5~2.7	
Size (mm)	Diameter	18.5±0.2	18.5±0.2
	Height	65.5±0.5	65.5±0.5
ESR @ 1kHz (mΩ)	≤25	≤15	
Nominal Energy (Wh)	3.6	3.6	
Energy Density (Wh/kg)	85.7	85.7	
Max. Constant Discharging Current (A) (≥95%)	6	7.5	
Max. Charging Current (A)	6	7.5	
Max. Discharging Current (A)	12	12	
Low temperature discharge efficiency (1C)	-40°C	≥70%	≥70%
	-20°C	≥80%	≥80%
Normal temperature cycle life@80%	≥8000	≥12000	
Operating Temperature (°C)	Charge	-50 ~ +65	-50 ~ +65
	Discharge	-50 ~ +65	-50 ~ +65
Weight (g)	42±2	42±2	

## C SERIES

### SPECIFICATIONS

PRODUCT MODEL		PLITR60100CWLA-20Ah-2.4V	PLITR60138CSTA-30Ah-2.4V
Nominal capacity (Ah)		20	30
Nominal voltage (V)		2.4	2.4
Charging and discharging voltage range (V)		1.5~2.8	1.5~2.8
Size (mm)	Diameter	60.5±0.3	60.5±0.3
	Height	110.5±0.5	146.5±0.3
ESR @ 1kHz (mΩ)		≤0.5	≤0.35
Nominal Energy (Wh)		48	72
Energy Density (Wh/kg)		73.8	85.7
Max. Constant Discharging Current (A) (≥95%)		160	240
Max. Charging Current (A)		240	360
Max. Discharging Current (A)		400	600
Low temperature discharge efficiency (1C)	-40°C	≥80%	≥80%
	-20°C	≥85%	≥85%
Normal temperature cycle life@80%		≥15000	≥15000
Operating Temperature (°C)	Charge	-50 ~ +65	-50 ~ +65
	Discharge	-50 ~ +65	-50 ~ +65
Weight (g)		650±10	840±10

## C SERIES

### SPECIFICATIONS

PRODUCT MODEL		PLITR60165CSTB-40Ah-2.4V	PLITR66160CSTE-45Ah-2.4V
Nominal capacity (Ah)		40	45
Nominal voltage (V)		2.4	2.4
Charging and discharging voltage range (V)		1.5~2.9	1.5~2.9
Size (mm)	Diameter	60.5±0.3	66.0±1.0
	Height	193.6±0.3	209.5±1.0
ESR @ 1kHz (mΩ)		≤0.3	≤0.3
Nominal Energy (Wh)		96	108
Energy Density (Wh/kg)		91.4	86.4
Max. Constant Discharging Current (A) (≥95%)		320	360
Max. Charging Current (A)		480	900
Max. Discharging Current (A)		800	1350
Low temperature discharge efficiency (1C)	-40°C	≥80%	≥80%
	-20°C	≥85%	≥85%
Normal temperature cycle life@80%		≥25000	≥30000
Operating Temperature (°C)	Charge	-50 ~ +65	-40 ~ +60
	Discharge	-50 ~ +65	-40 ~ +60
Weight (g)		1050±12	1250±12

## M SERIES

### SPECIFICATIONS

PRODUCT MODEL		PLITR60138MSTA-24Ah-2.4V
Nominal capacity (Ah)		24
Nominal voltage (V)		2.4
Charging and discharging voltage range (V)		1.5~2.8
Size (mm)	Diameter	60.5±0.3
	Height	146.5±0.3
ESR @ 1kHz (mΩ)		≤0.45
Nominal Energy (Wh)		57.6
Energy Density (Wh/kg)		72
Max. Constant Discharging Current (A) (≥95%)		120
Max. Charging Current (A)		144
Max. Discharging Current (A)		240
Low temperature discharge efficiency (1C)	-40°C	≥50%
	-20°C	≥70%
Normal temperature cycle life@80%		≥20000
Operating Temperature (°C)	Charge	-50 ~ +65
	Discharge	-50 ~ +65
Weight (g)		805±10

## X SERIES

### SPECIFICATIONS

PRODUCT MODEL		PLITR60138XWLB-24Ah-2.3V
Nominal capacity (Ah)		24
Nominal voltage (V)		2.3
Charging and discharging voltage range (V)		1.5~2.7
Size (mm)	Diameter	60.5±0.3
	Height	146.5±0.3
ESR @ 1kHz (mΩ)		≤0.3
Nominal Energy (Wh)		55.2
Energy Density (Wh/kg)		65
Max. Constant Discharging Current (A) (≥95%)		192
Max. Charging Current (A)		480
Max. Discharging Current (A)		720
Low temperature discharge efficiency (1C)	-40°C	≥45%
	-20°C	≥60%
Normal temperature cycle life@80%		≥30000
Operating Temperature (°C)	Charge	-50 ~ +65
	Discharge	-50 ~ +65
Weight (g)		830±10

# SUPERCAPACITOR

## SUPERCAPACITOR CELL

### PRODUCT DETAILS

- Utilizing Self-produced dry electrode;
- Compared with traditional capacitors, the energy density exceeds 10%;
- Under high temperature and high humidity conditions, the DC life is longer than 1500 hours;
- Long life, more than 1 million times;
- Suitable for 3.0V and above high voltage capacitors.



### SPECIFICATIONS

PRODUCT MODEL	PLUC1500C3R00WLA	PLUC3000C3R00WLA	PLUC3400C3R00WLA
Rated Capacitance (F)	1500	3000	3400
Capacitance Tolerance	0 ~ +20%	0 ~ +20%	0 ~ +10%
Max. Continuous Current (A)	( $\Delta T=15^{\circ}\text{C}$ )	103	146
	( $\Delta T=40^{\circ}\text{C}$ )	169	238
ESR (m $\Omega$ )	0.3	0.2	0.2
Max. Leakage Current (mA)	8	12	12
Min. Energy Storage (Wh)	1.88	3.75	4.25
Max. Usable Specific Power(kW/kg)	10.9	9.4	9.4
Max. Impedance Matching Specific Power (kW/kg)	25.1	23.8	24
Weight (g)	320 $\pm$ 5	525 $\pm$ 6	520 $\pm$ 6

## SUPERCAPACITOR MODULES

### PRODUCT DETAILS

- High power, low resistance and long service life;
- IP65 protection level;
- Metal shell, with good protection function;
- Active/passive equalization device and can be equipped with over-voltage or over-temperature alarm.



### SPECIFICATIONS

PRODUCT MODEL	PLUC16V500F-K10	PLUC160V6F-K10	PLUC48V165F-K10
S/P No.	1P6S	1P60S	1P18S
Dimensions (mm)	418*69*180	367*235*81	418*194*180
Weight (kg)	6.0 $\pm$ 0.2	6.0 $\pm$ 0.2	15.0 $\pm$ 0.5
Operatig Voltage Range (V)	0~16.2	0~162.0	0~48.6
Min. Energy (Wh)	17.8	20.6	52.8
Operating Temperature ( $^{\circ}\text{C}$ )	-40 ~ 65	-40 ~ 65	-40 ~ 65
Max. Charging Current (A)	199	25	163
Max. Discharging Current (A)	199	25	163
Cycle Life (Cycles)	100万	100万	100万

# ENERGY STORAGE SERIES



## PORTABLE POWER STATION

### PRODUCT DETAILS

The Plannano portable power station supply integrates multiple working modes, with a built-in high-performance lithium iron phosphate battery, a high-quality and safe BMS management system, and an efficient energy conversion inverter circuit. It can be placed indoors or in a car, and can be used as an emergency backup power source for home, office, and outdoor use.

- ◆ **High Efficiency**  
0.3S quick start;
- ☺ **Reliability**  
Passing UN38.3 vibration test;
- 🛡 **High Security**  
Pure sine wave does not hurt electrical appliances;
- 📦 **Portable**  
Light weight, portability, small in size;
- ✈ **Unrestricted**  
Unlimited charging, guaranteed safety;
- 🔋 **High-quality**  
High-quality automotive-grade power cells.

### SPECIFICATIONS

PRODUCT MODEL	M300	M700	Q1000	Q2400
Rated power (W)	300	700	1000	2400
Capacity (Wh)	266.4	699.3	1008	2304
Battery type	NCM lithium battery passing UL certification			
Power display	LCD	LCD	LCD	LCD
LCD	Various displays	Various displays	Various displays	Various displays
DC input (V/A)	15/4	24/6.25	15/4	15/4
AC fully charging time (H)	5 ~ 6	6 ~ 7	2 ~ 3	2 ~ 3
Charging input with PV (W)	60 max	150 max	400 max	800 max
Charging temperature range (°C)	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40
USB output	PD 60W*1 USB-Aoutput:QC3.0*3	PD 60W*1 USB-Aoutput:QC3.0*3	PD 100W*1 USB-Aoutput:QC3.0*3	PD 100W*1 USB-Aoutput:QC3.0*3
Smog lighter output (W)	12V10A 120W	12V10A 120W	12V10A 120W	12V10A 120W
DC output	12V/5A/DC5521*2	12V/5A/DC5521*2	12V/5A/DC5521*2	12V/5A/DC5521*2
LED Light	5W*2	5W*2	5W*2	5W*2
Dimensions (mm)	273*181*244	328*221*263	328*221*263	410*290*290
Weight (Kg)	3.95	7.4	11	20
Operating temperature (°C)	15 ~ 45	-20 ~ 60	-20 ~ 60	-20 ~ 60
Operating humidity	10%~90%	10%~90%	10%~90%	10%~90%
Wireless charging output (W)	10	10	10	10

## LOW-VOLTAGE STACKED 10-40KWh

### SPECIFICATIONS

PRODUCT MODEL	15KWh	20KWh	25KWh
Nominal Voltage (V)	48.0 / 51.2	48.0 / 51.2	48.0 / 51.2
Rated Capacity (Ah)	300	400	500
Cut-off Charge Voltage (V)	54.0 / 58.0	54.0 / 58.0	54.0 / 58.0
Cut-off Discharge Voltage (V)	39.0 / 42.0	39.0 / 42.0	39.0 / 42.0
Max. Charging Current (A)	100	100	100
Max. Discharging Current (A)	100	100	100
Communication Mode	RS485 / CAN	RS485 / CAN	RS485 / CAN
Size (mm)	585*360*658	585*360*808	580*360*958
Weight (Kg)	138 (About)	184 (About)	240 (About)
Certification	CE、IEC62619、UN、Syndrome of dangerous package		



## HOME ENERGY STORAGE

### PRODUCT DETAILS

Plannano household energy storage system products provide better energy solutions for household energy storage and green and environmentally friendly living. The product adopts advanced battery technology and can be combined with hybrid, off grid, photovoltaic inverters, photovoltaic modules, etc. to form an intelligent energy management system, ensuring the high energy density and long service life of the battery.

-  High power, Long cycle life;
-  Power expansion on demand, Free assembly;
-  Easy installation and aesthetically pleasing design;
-  Multiple protections, high stability of household electricity consumption.

## HIGH-VOLTAGE STACKED 10-40KWh

### SPECIFICATIONS

PRODUCT MODEL	10KWh	15KWh	20KWh
Nominal Voltage (V)	204	307	409
Rated Capacity (Ah)	50	50	50
Cut-off Charge Voltage (V)	232	350	466
Cut-off Discharge Voltage (V)	169	255	339
Max. Charging Current (A)	50	50	50
Max. Discharging Current (A)	50	50	50
Communication Mode	RS485 / CAN	RS485 / CAN	RS485 / CAN
Size (mm)	580*360*570	580*360*720	580*360*870
Weight (Kg)	100 (About)	141 (About)	188 (About)
Certification	CE、IEC62619、UN、Syndrome of dangerous package		



## INDUSTRIAL & COMMERCIAL ENERGY STORAGE

### PRODUCT DETAILS

LFP batteries, LTO batteries, and Supercapacitors can be used for independent or mixed design to leverage the new energy advantages of different battery cells. Configure a 3S management system that supports multiple parallel connections and flexible capacity configuration; Capable of independent operation from the network.

#### High precision & Intelligence

- ① Meet smart grid design specifications;
- ② Integrate the local controller to achieve unified dispatch management, and the stand-alone system can independently perform peak shaving and valley filling;
- ③ Equipped with PQ, VF, SVG and other functions to support independent operation of microgrid;
- ④ Outdoor design, protection grade IP54.

#### Efficient Conversion

- ① Intelligent temperature control system to improve system efficiency and battery cycle life;
- ② It has bidirectional current conversion, and charging has constant current, constant voltage and constant power modes.

#### Efficient Integration

- ① High system integration, integrating battery system, AC system, temperature control system, fire protection system, data monitoring system, etc.;
- ② Integrated container-type energy storage system design is convenient for transportation, simple construction, and low installation cost.

#### Flexible and Convenient

- ① The communication side PCS adopts a modular design, which is easy to install and maintain;
- ② Support for more flexible configuration schemes for multiple PCS AC parallel operation;
- ③ Integrated transportation, simple data exchange and visualization for on-site construction.

### SPECIFICATIONS

PRODUCT MODEL	PLPF0280C0-0768R0A	PLPF0280C0-1331R2A
Cell Type (V/Ah)	3.2V/280Ah	3.2V/280Ah
System Series and Parallel Parameters	1P240S	1P416S
Rated Capacity of Battery (KWh)	215.04	372.736
Rated Voltage of Battery (V)	768	1331.2
Battery Voltage Factor (V)	600~876	1123.2~1497.6
Max. Output Power (kVA)	110	220
Max. Output Current (A)	158	184
AC Rated Voltage (V)	400	690
Container Size (mm)	2100x2500x1100 (Air Cooled) 1300x2600x1000 (Liquid Cooled)	2300x2500x1400
Isolation Method	Transformer Isolation (Optional)	Transformer Isolation (Standard Configuration)
Weight (T)	2.65	4.5
Protection Level	IP54/IP55 (Optional)	IP54/IP55 (Optional)
Corrosion Protection Level	C4/C5 (Optional)	C4/C5 (Optional)
Operating Temperature Range (°C)	-30 ~ +60	-30 ~ +60
Degree Range	0-95%	0-95%
Cooling Method	Air Cooled/Liquid Cooled	Air Cooled/Liquid Cooled
Firefighting Methods	Aerosol/Heptafluoropropylene kang	Aerosol/Perfluorohexadone (Optional)
Max. Altitude (m)	4000	4000
Communication Protoco	Modbus-TCP/Modbus-RTU/IEC104	Modbus-TCP/Modbus-RTU/IEC104
Communication Method	RS485/Ethernet	RS485/Ethernet



## LARGE-SCALE ENERGY STORAGE

### PRODUCT DETAILS

By container integrated design, energy storage battery clusters, battery confluence cabinets, energy storage converters, transformers, power distribution cabinets and other equipment are integrated into the container.

#### Simple and Convenient

Modular design makes maintenance simple and convenient, plug-and-play, safe and reliable; pre-assembled design facilitates transportation and reduces on-site installation man-hours.

#### Intelligent Control

Intelligent thermal management system to achieve the temperature difference less than 3°C; intelligent early warning and fire protection design; intelligent monitoring to reduce manual inspections.

#### Integrated Design

Inverter and voltage boost integrated design, battery system 1500V integrated design.

#### Flexible Configuration

The energy of a single energy storage system is from 2MWh to 7MWh. The configuration is flexible and adjustable, and it is suitable for various applications.

#### Stability and Reliability

BMS and EMS linkage supports multiple protections; software-hardware dual guarantees, redundant design of communication and power supply loops; comprehensive fault diagnosis functions to meet fast, agile and reliable requirements.

### SPECIFICATIONS

PRODUCT MODEL	PLSF0280C0-6709R0A	PLPF0314C0-1331R2A
S/P No.	1P416S, 18Clusters	1P416S, 12Clusters
Dimensions (mm) (width*depth*height)	12192*2438*2896	6050*2438*2896
Weight (T)	76	50
Rated Energy (MWh)	6.7	5.015
Rated Voltage (V)	1331.2	1331.2
Operating Temperature (°C)	-30 ~ +60	-30 ~ +60
Communication Interface	RS485/CAN/Ethernet	RS485/CAN/Ethernet
Cooling Method	Liquid Cooling	Wind Cooling

PRODUCT MODEL	PLSF0280C0-3354R0A	PLPF0220C0-1331R2A
S/P No.	1P416S, 9Clusters	1P416S 9Clusters
Dimensions (mm) (width*depth*height)	6058*2438*2896	6085*2438*2896
Weight (T)	35	28
Rated Energy (MWh)	3.35	2.635
Rated Voltage (V)	1331.2	1331.2
Operating Temperature (°C)	-30 ~ +60	-30 ~ +60
Communication Interface	RS485/CAN/Ethernet	RS485/CAN/Ethernet
Cooling Method	Liquid Cooling	Liquid Cooling



# SMART CHARGING PILE



## 7KW AC CHARGING PILE

### SPECIFICATIONS

PRODUCT MODEL	SMT-A1G7TE(Euro)/SMT-A1G7T(National Standard)
<b>Electrical Indicators</b>	
Input Voltage (V)	AC220 ± 20%
AC Frequency (Hz)	50 / 60 ± 10%
Maximum output power of single circuit (A)	32
Rated Power (KW)	7
<b>Environmental Indicators</b>	
Operating Temperature (°C)	-25 ~ +50
Protection Grade	IP54
Charging Interface	Single gun to meet the national standard GB/T 20234.2
<b>Protection Function</b>	
Safety	Protection function Full self-stop, input over/under voltage Overload, overcurrent, short circuit, leakage, etc. Overload, overcurrent, short circuit, leakage and other protection functions

# DC INTEGRATED CHARGING PILE

### PRODUCT DETAILS

Based on our own operational service platform, we provide solution including R&D, design, manufacturing to meet various customized needs.

- Energy Saving
- Economically efficient
- Intelligent charging allocation
- Ultra low power consumption



### SPECIFICATIONS

PRODUCT MODEL	60kW/80kW	120kW/160kW	240kW	360kW
Input Voltage (V)	Three-phase 380Vac	Three-phase 380Vac	Three-phase 380Vac	Three-phase 380Vac
Input Current (A)	<110/140	<220/280	<500	<660
AC Input Frequency (Hz)	40 ~ 65	40 ~ 65	40 ~ 65	40 ~ 65
PF	≥0.99	≥0.99	≥0.99	≥0.99
Rated Output Power (KW)	80	160	240	360
Output Voltage (Customizable)	200VDC~750VDC	200VDC~750VDC	200VDC~750VDC /1000VDC	200VDC~750VDC
Output Current (A) (Customizable)	≤90/120	≤180/240	≤500	≤500
Precision of Voltage Regulation	≤+1%	≤+1%	≤+1%	≤+1%
Steady current accuracy	≤+1%	≤+1%	≤+1%	≤+1%
Efficiency	≥95%	≥95%	≥95%	≥95%
Operating Temperature Range (°C)	-25 ~ +50	-25 ~ +50	-25 ~ +50	-25 ~ +50
Charging Interface	Single gun/Double gun (supports self distribution of dual guns with the same power)			
Protection Grade	IP54			
Protection Function	Input over-voltage/under-voltage, Output over-voltage, over-current, over-temperature, short circuit, lightning protection, emergency stop and other protection functions			



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# 03 INDUSTRY APPLICATIONS

THE LEADER IN  
DRY ELECTRODE AND SAFE ENERGY STORAGE

33 FIELDS OF APPLICATION

35 TYPICAL CASES

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# FIELDS OF APPLICATION

## ENERGY STORAGE

- Peak regulation and frequency regulation on the power generation side
- Peak regulation and frequency regulation on the grid side
- Commercial and industrial energy storage system
- Thermal power frequency modulation



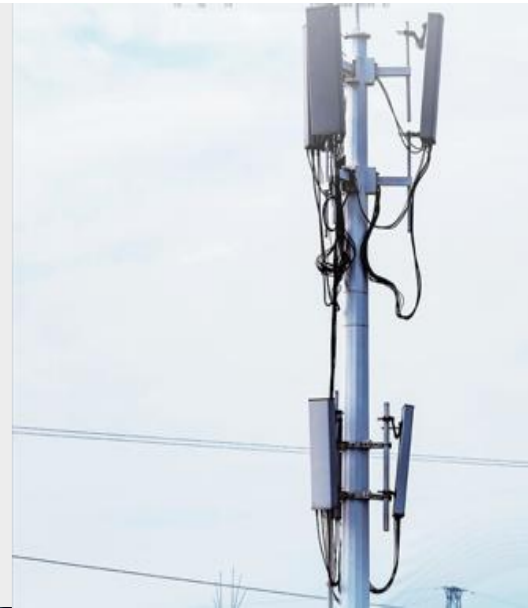
## POWER GENERATION

- Wind turbine pitch backup power
- Distributed wind-solar-storage integrated system power supply
- Tower elevator power supply



## ELECTRICITY

- DTU/FTU power supply
- Power supply for communication base stations
- Smart meter backup power



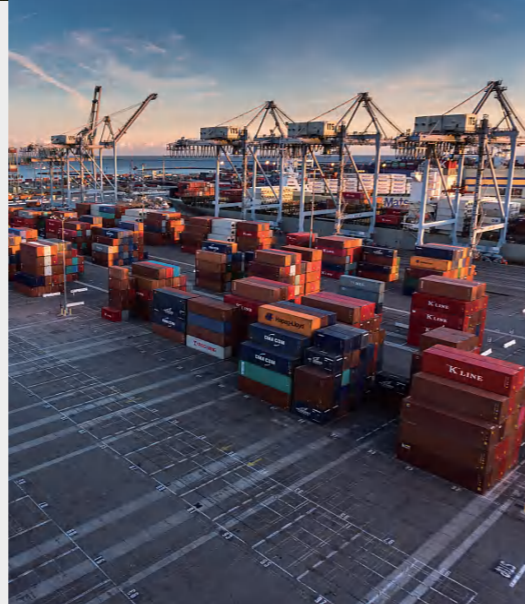
## TRANSPORTATION

- Subway energy recovery
- Power supply for special transport vehicle
- Fuel cell power supply supporting fuel cell



## PETROLEUM

- Energy storage system for fracturing operations on drilling platforms
- Power supply for natural gas production well equipment
- Power supply for the RTU in the valve chamber of the natural gas transmission pipeline
- Industrial and commercial energy storage system at gas station



## OTHER

- Power supply for energy recovery of the heavy-duty port machinery
- Power supply for energy recovery of the elevator
- Power supply for natural gas monitoring instruments
- Lighting power supply for alpine and cold areas
- Power supply for the mine
- Starting power supply inalpine and cold areas



# TYPICAL CASES



Heilongjiang | 5G communication base station backup power | 2MWh



Europe | Power grid super capacity frequency regulation | 6.5MW/3S



Qinghai | Natural gas plant station energy storage project | 386.4V/192Ah



Hebei | Outdoor small energy storage power supply | 12V30Ah



Hebei | DTU Backup Power | 64V80F



Anhui | Wind and solar power generation, energy storage, charging - supercapacitors - zero carbon park frequency regulation | 20KW/30S



Zhejiang | Lithium titanate gas station industrial and commercial energy storage | 100KWh



Zhejiang | Off grid distributed energy storage (electric support vehicle) | 304KWh



Hebei | Super capacitor energy recovery system for rail transit | 1KWh

# TYPICAL CASES



South Asia | Industrial and Commercial Energy Storage | 2.06MWh



Inner Mongolia | Wind Power Distribution and Storage | 43MWh



Jiangsu | Industrial and Commercial Energy Storage | 1.025MWh



Gansu | Wind and solar energy storage and charging microgrid | 400KWh



Ningxia | Shared Power Station | 400MWh



Gansu | Electrochemical energy storage project | 80MWh



Guangdong | Industrial and Commercial Energy Storage | 4MWh



Tianjin | Optical Storage and Charging Microgrid | 1MWh



Guizhou | Shared Power Station | 400MWh

# TYPICAL CASES



Sichuan | Photovoltaic Distribution and Storage | 50MWh



Xinjiang | Wind and solar energy distribution and storage | 200MWh



Henan | Wind and solar energy distribution and storage | 70MWh



Inner Mongolia | wind power distribution and storage | 80MWh



Xinjiang | Wind and solar energy distribution and storage | 315MWh

## SMART PHOTOVOLTAIC ENERGY STORAGE AND CHARGING INTEGRATED PROJECT CASE



[The Lingbo Science and Technology Innovation Park] charging station is located in Luoyang City, covering an area of approximately 8000 square meters and equipped with 200 standard parking spaces. It has a 1000KWh mobile off grid energy storage system and a self built 230KW ground photovoltaic power station. It adopts a "self generated and self used, surplus electricity connected to the grid" mode. The project is equipped with a new energy intelligent charging station that integrates service functions such as a car wash, driver's lounge, and convenience store.

### Integrated Solution for Optical Storage and Charging

Stereoscopic garage, advertising screen (LCD display, lightbox display), street lights, deep integration solution

**Centralized charging station:** composed of AC charging, integrated and split DC fast charging piles, it is an important component of the urban charging network. Suitable for deploying centralized fast charging areas such as bus stops, taxi rest areas, large parking lots, and gas stations.

**Distributed charging station intelligent parking lot:** mainly concentrated in urban residential parking lots, shopping mall parking lots, roadside open spaces, highways and other areas. Implement functions such as device management, billing, payment settlement, user management, and centralized monitoring through cloud platforms and operation management systems.

**Segmented solutions:** intelligent operation system, low-power supporting service platform, APP+WeChat client.

Peak shaving and valley filling, reducing electricity expenses through price differences;

Reduce the distribution capacity on the grid side and expand the power capacity of charging stations;

Can participate in main grid regulation to enhance the reliability of power grid operation;

Large power range for emergency power supply;

Effectively utilizing photovoltaic power generation, capable of grid connected operation and off grid operation, improving power supply flexibility and reliability;

Integrated design of light storage and charging, intelligent energy scheduling, providing reliable and intelligent charging services for electric vehicles.



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# 04 GLOBAL SERVICES

THE LEADER IN  
DRY ELECTRODE AND SAFE ENERGY STORAGE

43 PARTNERS

45 BUSINESS DISTRIBUTION

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# PARTNERS



国家电投  
SPIC



中国电科



中国石油



中国石化  
SINOPEC



国家能源集团  
CHN ENERGY



中航工业



平高集团  
PINGGAO GROUP



中信集团  
CITIC Group  
共 创 新 可 能

CHINA TOWER  
中国铁塔

中国中车  
CRRC

REN  
瑞能电气  
REnergy Electric



许继集团

LISHEN  
Power Your Life!

LIGOO  
—力高技术—

凯美  
KAIM

科林电气  
KE ELECTRIC

合容电气  
HERONG ELECTRIC

WEICHAI  
潍 柴

亿华通  
SinoHytec

睿能世纪  
RAY POWER

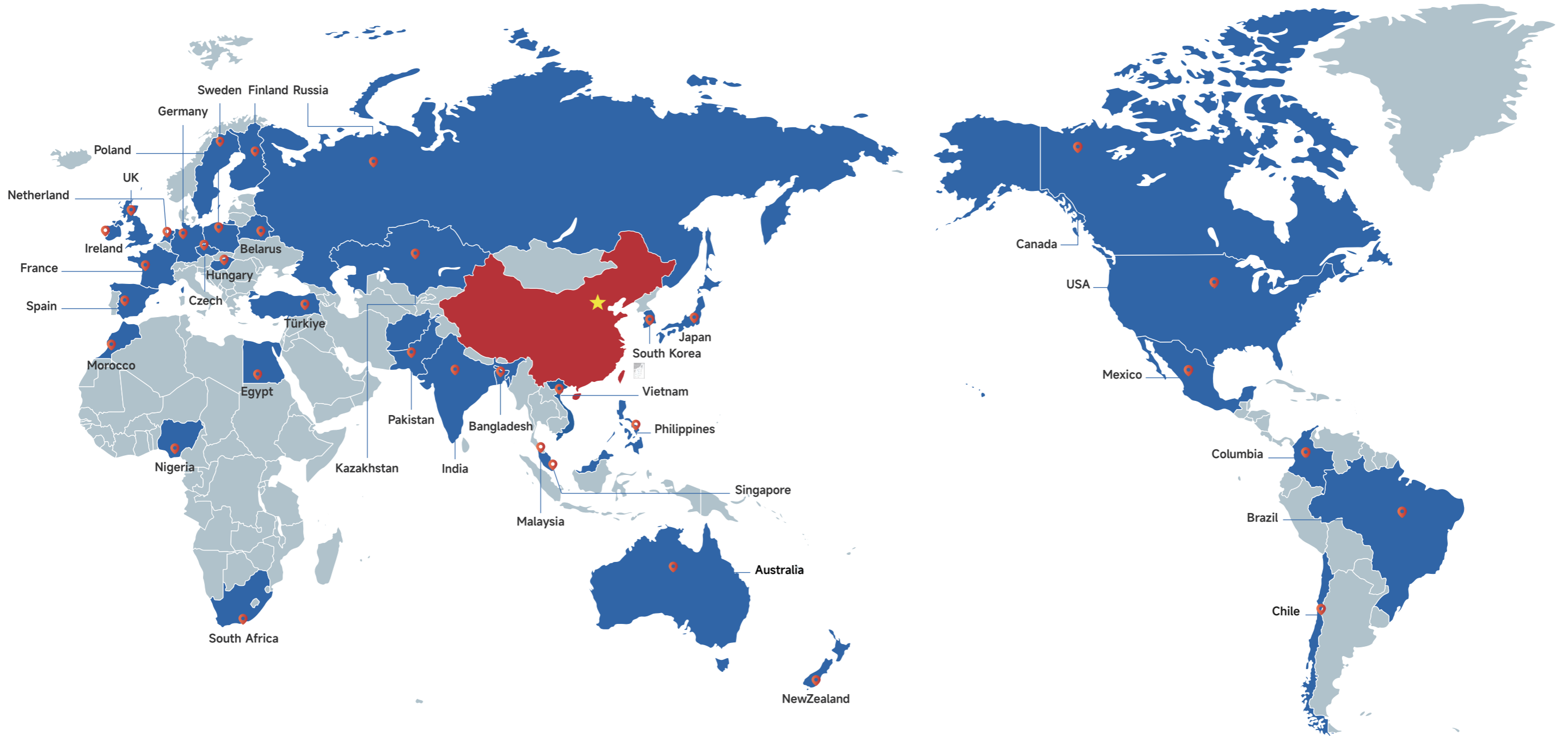
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深科技  
KAIFA

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# BUSINESS DISTRIBUTION





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