

# ESS Global Footprint (75GW/180GWh)



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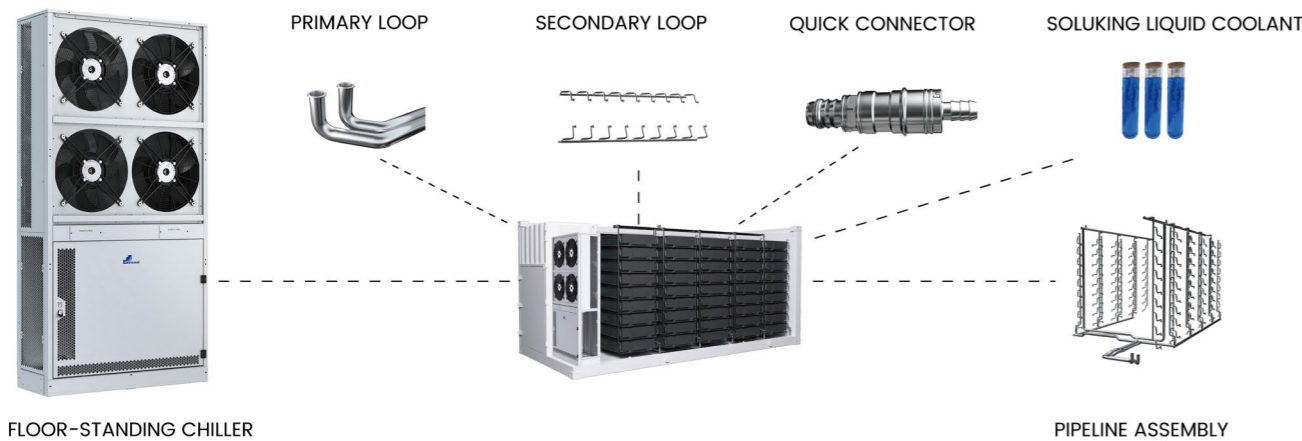
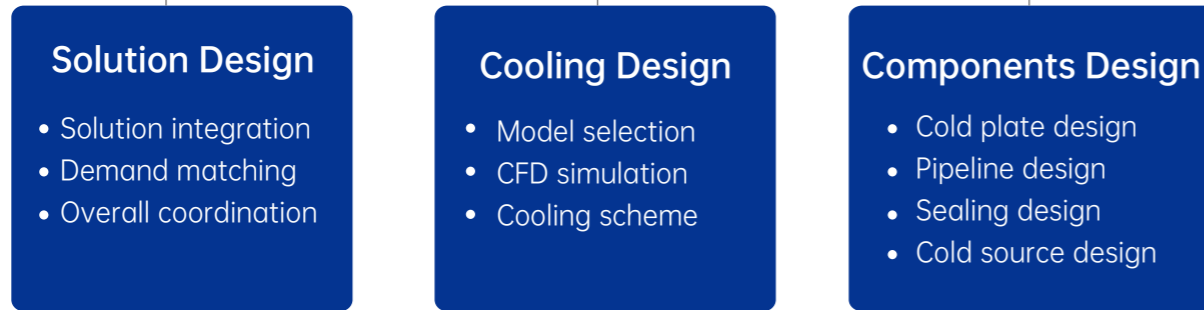
# ENERGY STORAGE COOLING SOLUTIONS



RECYCLABLE

# BattCool Full Chain Liquid Cooling Solution

## Full Chain Liquid Cooling Solution



### Quick Connector

- Steel ball locking structure design, direct insertion automatic locking
- Special treatment for shell material and coating
- Superior impurity resistance
- Operating temperature: -55°C ~+175°C
- Mechanical lifespan: 2000 plugging and unplugging cycles
- Working pressure: 0-2MPa
- Working medium: deionized water, coolant, glycol solution

### Liquid Cooling Pipeline

- Can be tailored according to the layout of containers and battery modules
- The flow rate and resistance of the whole system perfectly match with the battery cold plate and liquid cooling unit
- Produced in segments before delivery, ensuring the pipeline cleanliness and air tightness
- Equipped with self-sealing joint, convenient for quick maintenance of single battery module
- Safe connection and disconnection without leakage, plug-in and plug-out under pressure without drainage
- No replenishment needed after replacement, greatly saving maintenance time

### Liquid Cold Plate

- Customized shape and size
- Formed by welding, blowing, CNC, milling and other processes
- High reliability, tight sealing, corrosion resistance and leakage prevention design
- Large heat dissipation, good temperature uniformity, low thermal and flow resistance
- Working temperature: -25°C ~120°C
- Working pressure: ≤5 Bar
- Average temperature difference: <2°C
- Different flow channels available to provide different thermal solutions

# Long-term Energy Storage High-efficient Operation

Long Life Time | High Reliability | High Value



- Dual-backup system for examination, circulation and refrigeration
- Abnormality auto-treatment: automatic control, automatic frequency reduction, automatic pressure relief
- Real-time cell temperature sensing: matching the optimal cell cooling temperature at real time to avoid temperature fluctuation



- Energy efficiency multiplication technology, full-frequency, high efficiency all the year round, XFreeCooling technology
- Full chain liquid cooling: heat dissipation from the cell, overall liquid cooling
- Intelligent cooling capacity distribution: flow uniformity ±10%, cell temperature difference ≤2°C



- Engineering productization: factory prefabrication, product modularization, welding free, quick assembly
- Eco-friendly, quick replacement in 30 minutes: safe plugging and unplugging without leakage, plug-in and plug-out under pressure without drainage
- Intelligent operation and maintenance: digital status collection, disassembly-free maintenance, and automatic coolant replenishment system
- 12 years' practical experience: adaptable to all energy storage environments and all power grids



## » Features & Applications



### Excellent Performance

- Adopt full-frequency conversion technology with high energy efficiency. Compressors, fans, and pumps of chiller are all controlled by frequency converter
- A closed coolant circulation system increases the general lifespan of coolant by more than 7-8 years
- With high-precision control technology, coolant temperature control precision is  $\pm 1^{\circ}\text{C}$
- With AI energy-saving control technology, energy consumption is reduced while EER of chiller increases by 30%

### Safety & Reliability

- Designed lifespan > 15 years. 24/7 operation available
- High level of safety allows applications in industrial and commercial ESS scenarios
- With proactive safety control technology, cell temperature variation trends can be detected proactively, inhibiting thermal runaway

### Installation

- Compact design with various styles meets the requirements of diverse layouts
- Vertical, horizontal embedded and door-mounted installation methods are supported



## » Product Specification

Model	EMW30HDNC1D	EMW30HFNC1R	EMW50HDNC1D
Power Supply (V, Hz)	220~240,50/60	220~240,50/60	220~240,50/60
Cooling Capacity (kW)	3@W18/L45	3@W18/L45	5@W18/L45
Heating Capacity (kW)	2@W10	2@W10	2@W10
System Circulation Flow (L/min)	30@60kPa	30@60kPa	46.5@60kPa
Refrigerant	R134a	R134a	R134a
Supported Refrigerating Medium	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution
Certification	CE&UL	CE&UL	CE&UL
Weight (kg)	83	75	85
Dimension (mm, WxDxH)	275×1050×800	700×900×245	275×1050×800
IP Protection Level	IPX5	IPX5	IPX5
Working Ambient Temperature Range	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C
Mounting Method	Vertical Embedded	Horizontal Embedded	Vertical Embedded

Model	EMW50HFNC1R	EMW90HDNC1C	EMW90HDNC1U
Power Supply (V, Hz)	220~240,50/60	220~240,50/60	220~240,50/60
Cooling Capacity (kW)	5@W18/L45	8@W18/L45	8@W18/L45
Heating Capacity (kW)	2@W10	2@W10	2@W10
System Circulation Flow (L/min)	46.5@60kPa	50@90kPa	50@90kPa
Refrigerant	R134a	R134a	R134a
Supported Refrigerating Medium	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution
Certification	CE&UL	CE	UL
Weight (kg)	75	140	140
Dimension (mm, WxDxH)	700×900×245	275×1185.5×1074	275×1150×1040
IP Protection Level	IPX5	IPX5	IPX5
Working Ambient Temperature Range	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C
Mounting Method	Horizontal Embedded	Vertical Embedded	Vertical Embedded

\* Remark: environmentally friendly refrigerant available, please consult Envicool for details.

## » Features & Applications



### Intelligent Operation & Maintenance

- Support multiple communication methods, including RS485 and TCP IP
- Support multiple communication protocols, including Modbus RTU and CAN
- Self-starting function is available. No manual effort is required when powering on and off
- Hierarchical alarm and protection control functions contribute to the safe operation of BESS
- Support vacuum infusion, greatly shortening the installation and commissioning time
- All the connection ports are on the front, enabling convenience for installation, operation and maintenance
- Reserved power port for coolant replenishment pump guarantees easy coolant replenishing at BESS site
- With drawer-style control box, maintenance can be conducted simply by removing the control box

### Applications

- BESS Container
- BESS Cabinet



## » Product Specification

Model	EMW75HDNC1E	EMW75HDNC1G	EMW100HDNC1E
Power Supply (V, Hz)	220~240,50/60	220~240,50/60	220~240,50/60
Cooling Capacity (kW)	7.5@W15/L35	7.5@W15/L35	10@W15/L35
Heating Capacity (kW)	2@W10	2@W10	2@W10
System Circulation Flow (L/min)	80@60kPa	80@60kPa	100@110kPa
Refrigerant	R410A	R32	R410A
Supported Refrigerating Medium	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution
Certification	CE&UL	CE&UL	CE&UL
Weight (kg)	75	75	160
Dimension (mm, WxDxH)	1230×300×1400	1230×300×1400	1230×300×1400
IP Protection Level	IPX5	IPX5	IPX5
Working Ambient Temperature Range	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C
Mounting Method	Door Mounted	Door Mounted	Door Mounted

Model	EMW100HDNC1G	EMW100HDNC1R	EMW100HDNC1S
Power Supply (V, Hz)	220~240,50/60	3N~,480,50/60	3N~,380,50/60
Cooling Capacity (kW)	10@W15/L35	10@W20/L45	10@W20/L45
Heating Capacity (kW)	2@W10	2@W10	2@W10
System Circulation Flow (L/min)	100@110kPa	72@80kPa	72@80kPa
Refrigerant	R32	R134a	R134a
Supported Refrigerating Medium	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution
Certification	CE&UL	CE&UL	CE&UL
Weight (kg)	160	195	195
Dimension (mm, WxDxH)	1230×300×1400	750×350×1700	750×350×1700
IP Protection Level	IPX5	IPX5	IPX5
Working Ambient Temperature Range	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C
Mounting Method	Door Mounted	Door Mounted	Door Mounted

\* Remark: environmentally friendly refrigerant available, please consult Envicool for details.

## » Features & Applications



### Excellent Performance

- Adopt full-frequency conversion technology with high energy efficiency. Compressors, fans and pumps of chiller are all controlled by frequency converter
- A closed coolant circulation system increases the general lifespan of coolant by 7-8 years
- With high-precision control technology, coolant temperature control precision is  $\pm 1^{\circ}\text{C}$
- With X-Freecooling system, the AEER of chiller increases up to 4.62

### High Safety & Reliability

- Designed lifespan > 15 years, 24/7 operation available
- High level of safety allows applications to centralized energy storage power station
- With proactive safety control technology, cell temperature variation trends can be detected proactively, inhibiting thermal runaway
- Integrated coolant tank ensures automatic coolant replenishment

### Intelligent Operation & Maintenance

- Support multiple communication methods, including RS485 and TCP IP
- Support multiple communication protocols, including Modbus RTU and CAN
- Self-starting function is available. No manual effort is required when powering on and off
- Hierarchical alarm and protection control functions contribute to the safe operation of BESS
- Support vacuum infusion, greatly shortening the installation and commissioning time
- Reserved power port for coolant replenishment pump guarantees easy coolant replenishing at BESS site
- All components can be maintained from the front

### Applications

- Equipment Container
- BESS Container



## » Product Specification

Model	EMW200HCNC3R	EMW300HCNC3R	EMW400HCNC3R	EMW400HCNC1A	EMW400HCNC1B
Power Supply (V, Hz)	3~,380~480,50/60	3~,380~480,50/60	3~,380~480,50/60	3~,480,50/60	3~,380,50/60
Cooling Capacity (kW)	20@W18/L45	30@W18/L45	40@W18/L45	40@W18/L45	40@W18/L45
Heating Capacity (kW)	12@W10	12@W10	12@W10	12@W10	12@W10
System Circulation Flow (L/min)	360@150kPa	360@150kPa	400@150kPa	260@160kPa	260@160kPa
Refrigerant	R410A	R410A	R410A	R410A	R410A
Supported Refrigerating Medium	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution
Certification	CE&ETL	CE&ETL	CE&ETL	CE&ETL&SAA	CE&ETL&SAA
Weight (kg)	320	350	400	460	460
Dimension (mm, WxDxH)	980×630×2400	980×630×2400	980×630×2400	980×1400×1800	980×1400×1800
IP Protection Level	IPX5	IPX5	IPX5	IPX5	IPX5
Working Ambient Temperature Range	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C
Mounting Method	Floor Mounted	Floor Mounted	Floor Mounted	Floor Mounted	Floor Mounted

Model	EMW400HDNC1C-R/L	EMW600HCNC1A	EMW600HCNC3R	EMW600HCNC3S	EMW800HCNC1B
Power Supply (V, Hz)	3~,380~480,50/60	3~,380~480,50/60	3~,380,50/60	3~,480,50/60	3~,380,50/60
Cooling Capacity (kW)	40@W18/L45	60@W15/L35	60@W15/L35	60@W15/L35	80@W18/L35
Heating Capacity (kW)	12@W10	18@W10	24@W10	24@W10	18@W10
System Circulation Flow (L/min)	320@200kPa	420@150kPa	500@150kPa	500@150kPa	560@150kPa
Refrigerant	R410A	R32	R32	R32	R410A
Supported Refrigerating Medium	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution	50% Ethylene Glycol Solution
Certification	CE&ETL	CE&UL	CE&ETL	ETL	SAA
Weight (kg)	500	600	500	500	680
Dimension (mm, WxDxH)	980×630×2400	980×1400×1800	1200×440×2400	1200×440×2400	1200×1400×2300
IP Protection Level	IPX5	IPX5	IPX5	IPX5	IPX5
Working Ambient Temperature Range	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C	-30°C ~ 55°C
Mounting Method	Floor Mounted	Floor Mounted	Floor Mounted	Floor Mounted	Floor Mounted

\* Remark: environmentally friendly refrigerant available, please consult Envicool for details.

## » Features & Applications



### Excellent Thermal Performance

- Lower air supply design, uniform air supply, fast cooling
- Support cooling, heating, dehumidification, air supply mode
- Configured with PTC heater, safe and reliable
- Professional dehumidification design, control relative humidity
- Fan speed regulation function for standard configuration, saving energy and reducing noise

### Intelligent Operation & Maintenance

- RS485 interface for remote control, support Modbus RTU protocol
- Support dry contact alarm and remote on/off switching
- Full front maintenance, easy and convenient
- Integrated design, saving on-site installation and commissioning costs
- Optional smoke detector, access control and water immersion alarm signal output

### Safety & Reliability

- Self start when power on, delay start, various alarm reports and protection functions available
- LCD display, with easy access to parameter and alarm status
- RoHS 2.0 compliant, support environmental friendly refrigerants
- Optional configured separate output for smoke detector, access control and water immersion alarms

### Applications

- Equipment Container
- BESS Container
- BESS Cabinet



## » Product Specification

Model	EC06HDNC1U	EC20HDNC1U	EC20HDNC1R	EC20HDNC1E	EC25HDNC1E
Power Supply (V, Hz)	230, 50/60	230, 50/60	230, 50/60	230, 50/60	230, 50/60
Cooling Capacity (kW)	0.6(L35/L35, 50Hz) 0.65(L35/L35, 60Hz)	2(L35/L35, 50Hz) 2.3(L35/L35, 60Hz)	2(L35/L35, 50Hz) 2.3(L35/L35, 60Hz)	2.1(L35/L35)	2.5(L35/L35)
Heating Capacity (kW)	0.5	1.05	1.05	0.8	0.8
Internal Airflow (m³/h)	180	650	650	650	700
Refrigerant	R134a	R134a	R513A	R513A	R513A
Certification	CB&UL	CE&UL	CE&UL	UL	UL
Weight (kg)	20.5	35	35	39	39
Dimension (mm, WxDxH) With Flange	352*170*583	483*200*783	483*200*783	483*257*783	483*257*783
Dimension (mm, WxDxH) Without Flange	320*170*550	446*200*746	446*200*746	446*257*746	446*257*746
IP Protection Level	IPX5 For Outdoor Side	IPX5 For Outdoor Side	IPX5 For Outdoor Side	IPX5 For Outdoor Side	IPX5 For Outdoor Side
Working Ambient Temperature Range(°C)	-40~+55	-40~+55	-40~+55	-40~+55	-40~+55
Mounting Method	Door Mounted	Door Mounted	Door Mounted	Door Mounted	Door Mounted

Model	MC05HDNC1U	MC06HDNC1A	MC15HDNC1B
Power Supply (V, Hz)	220, 50/60	220~240, 50/60	220, 50
Cooling Capacity (kW)	0.5(L35/L35, 50Hz) 0.55(L35/L35, 60Hz)	0.6(L35/L35)	1.5(L35/L35)
Heating Capacity (kW)	0.5	0.5	1
Internal Airflow (m³/h)	120	120	380
Refrigerant	R513A	R134a	R134a
Certification	CE&UL	CE	CE
Weight (kg)	21	17	32
Dimension (mm, WxDxH) With Flange	352*145*583	352*170*582	495*195*795
Dimension (mm, WxDxH) Without Flange	315*145*545	315*170*545	495*195*795
IP Protection Level	IPX5 For Outdoor Side	IPX5 For Outdoor Side	IPX5 For Outdoor Side
Working Ambient Temperature Range(°C)	-20~+55	-40~+55	-40~+55
Mounting Method	Door Mounted	Door Mounted	Door Mounted

\* Remark: environmentally friendly refrigerant available, please consult Envicool for details.

## » Features & Applications



### Excellent Thermal Performance

- Upper air supply design, remote air supply, fast cooling
- Support cooling, heating, dehumidification, air supply mode
- Configured with PTC heater, safe and reliable
- Professional dehumidification design, control relative humidity
- Fan speed regulation function for standard configuration, saving energy and reducing noise

### Intelligent Operation & Maintenance

- RS485 interface for remote control, support Modbus RTU protocol
- Support dry contact alarm & remote on/off switching
- Front or back maintenance, easy and convenient
- Integrated design, saving on-site installation and commissioning costs

### Safety & Reliability

- Self start when power on, delay start, various alarm reports and protection functions available
- LCD display, with easy access to parameter and alarm status
- RoHS 2.0 compliant, support environmental friendly refrigerants

### Applications

- Equipment container
- BESS Container
- BESS Cabinet



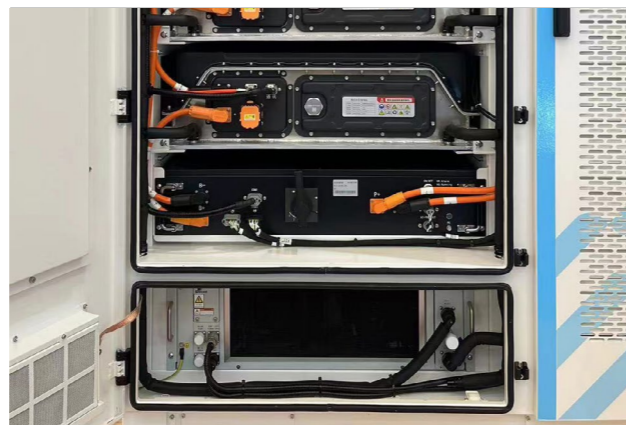
## » Product Specification

Model	MC30HDNC1A	MC30HDNC1U	MC50HDNC1A	MC50HDNC1U
Power Supply (V, Hz)	220, 50/60	230, 50/60	220, 50/60	230, 50/60
Cooling Capacity (kW)	3(L35/L35, 50Hz) 3.2(L35/L35, 60Hz)	3(L35/L35, 50Hz) 3.1(L35/L35, 60Hz)	5(L35/L35, 50Hz) 5.2(L35/L35, 60Hz)	5(L35/L35, 50Hz) 5.1(L35/L35, 60Hz)
Heating Capacity (kW)	2	1	3	2
Internal Airflow (m³/h)	700	700	1400	1500
Refrigerant	R134a	R134a	R134a	R134a
Certification	CE	UL	CE	UL
Weight (kg)	62	66	88	90
Dimension (mm, WxDxH) With Flange	550*250*1350	550*250*1350	671*300*1401	671*300*1401
Dimension (mm, WxDxH) Without Flange	500*250*1300	500*250*1300	620*300*1350	620*300*1350
IP Protection Level	IPX5 For Outdoor Side	IPX5 For Outdoor Side	IPX5 For Outdoor Side	IPX5 For Outdoor Side
Working Ambient Temperature Range(°C)	-40~+55	-40~+55	-40~+55	-25~+55
Mounting Method	Door Mounted	Door Mounted	Door Mounted	Door Mounted

Model	MC90HDNC1U	MC90HDNC1R	MC200HDNC1B	MC200HDNC1C
Power Supply (V, Hz)	220, 50/60	220, 50/60	480, 3N~ 50/60	380~415, 3N~ 50/60
Cooling Capacity (kW)	10.2(L35/L35)	10.2(L35/L35)	20(L27/L35)	20(L27/L35)
Heating Capacity (kW)	3	3	9	9
Internal Airflow (m³/h)	2900	2900	5500	5500
Refrigerant	R134a	R513A	R410A	R410A
Certification	CE&UL	CE&UL	UL	CE
Weight (kg)	125	125	350	320
Dimension (mm, WxDxH) With Flange	550*300*1700	550*300*1700	1089*570*2390	1089*570*2390
Dimension (mm, WxDxH) Without Flange	620*300*1770	620*300*1770	1000*570*2345	1000*570*2345
IP Protection Level	IPX5 For Outdoor Side	IPX5 For Outdoor Side	IPX5 For Outdoor Side	IPX5 For Outdoor Side
Working Ambient Temperature Range(°C)	-30~+55	-30~+55	-40~+50	-40~+50
Mounting Method	Door Mounted	Door Mounted	Wall Mounted	Wall Mounted

\* Remark: environmentally friendly refrigerant available, please consult Envicool for details.

## » Case Reference



## » About US

Founded in 2005, Envicool (SZSE:002837) is the world's leading solution provider for thermal management with its business in more than 120 countries and regions across the globe.

We help our customers overcome their thermal management challenges through our tailor-made products and industry-leading solutions. Our comprehensive products specialize in energy storage systems, data centers, telecommunications, as well as cold chain logistics, such as vaccine transportation.

Where there is cooling demand, there is Envicool. Dedicating to the design and manufacturing of highly energy-efficient temperature control products, we strive to build a greener and cooler world.

## Manufacturing Bases and R&D Centers

7 major sales and after-sales areas in China

39 customer service centers in China



Shenzhen HQ Manufacturing and R&D Base | Shanghai Manufacturing and R&D Base | Suzhou Manufacturing and R&D Base | Zhongshan Manufacturing and R&D Base | Beijing R&D Base | Hebei Manufacturing Base | Henan Manufacturing and R&D Base

## Eight Major Businesses



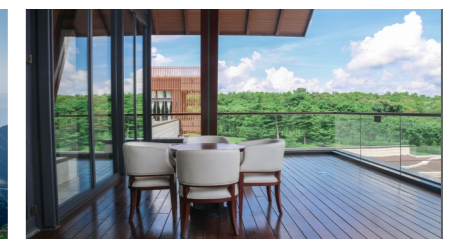
### Digital Wave

Data Center Cooling / Data Center Integration  
One-stop Liquid Cooling and Electronics Cooling



### New Energy Revolution

Energy Storage Cooling  
Outdoor Cabinet Cooling



### Better Life

Cold Chain Cooling / New EV Bus and Rail Transit Cooling / Indoor Air Environment Control