



SUNON® FIRST CHOICE GLOBALLY
Cooling Solutions

2024 Q2 Operating Results

Sunonwealth Electric Machine Industry Co., Ltd.

2421.TW / 2421 TT

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SUNON Thermal Everywhere

■ Fan ■ Fan tray ■ Heat Pipe ■ Vapor Chamber ■ Heat Sink ■ Cooling Module ■ Cold Plate ■ Liquid Cooling



5G Base Stations



Networking



electric vehicles



Industry Inverter / Drive



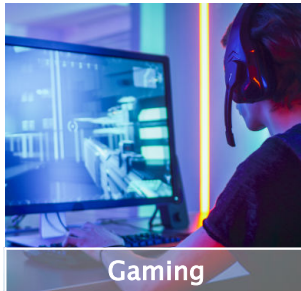
Renewable Energy



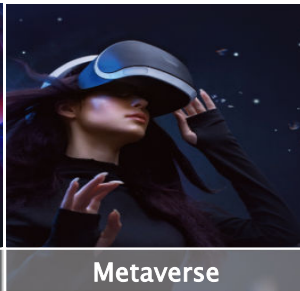
surveillance



medical



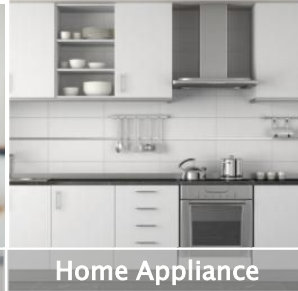
Gaming



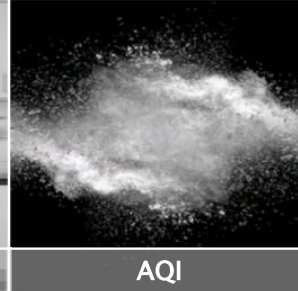
Metaverse



IT



Home Appliance



AQI

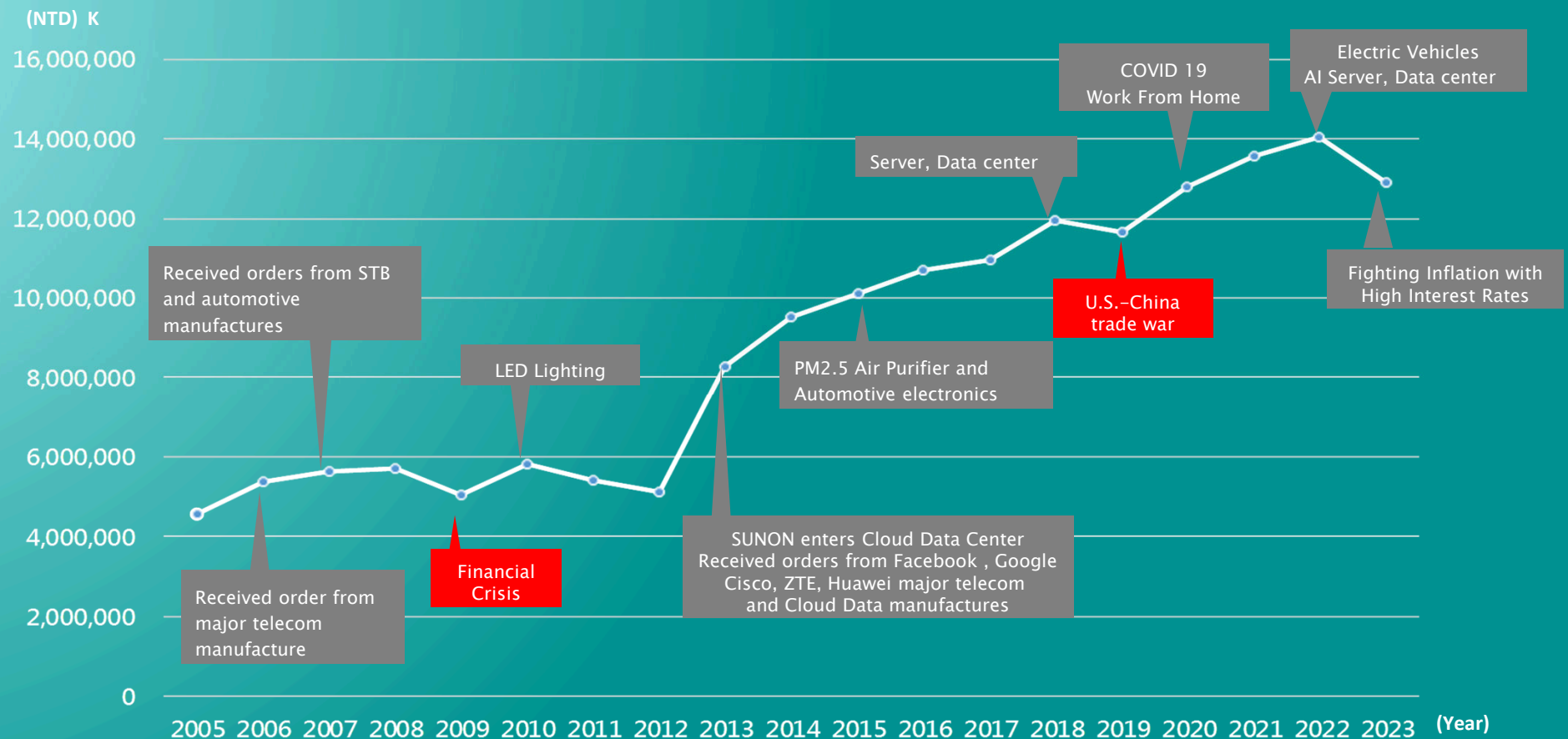


Air Purifier UVC Solution



Industrial Ventilation

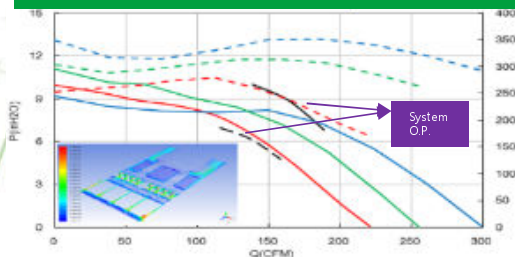
Growth Pattern



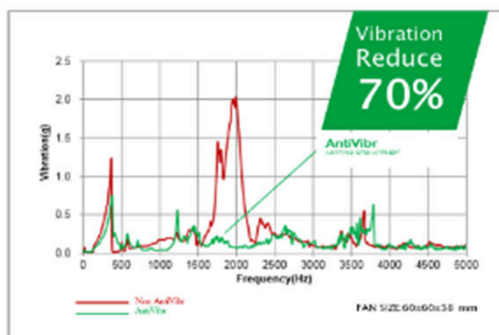
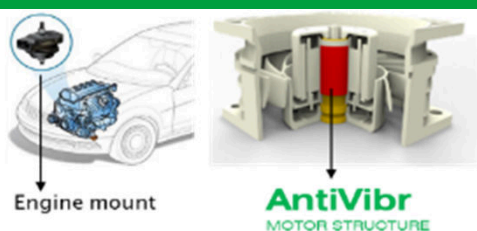
Thermal Technology Keeps Pace With the Times

Future will be supported by powerful computing capacity and the ultra-speed Internet with high reliability, which tests the effectiveness of thermal solutions. The change in the world stimulates thermal technology to update and advance to be suitable for real-time computing systems' needs. Technological advancement in heat dissipation provides the most effective operating temperature management to achieve excellence.

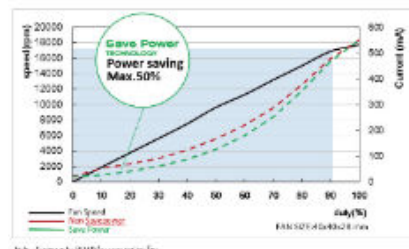
High Fan Efficiency



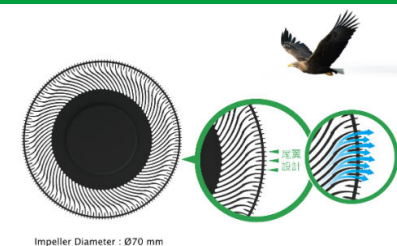
Low Vibration



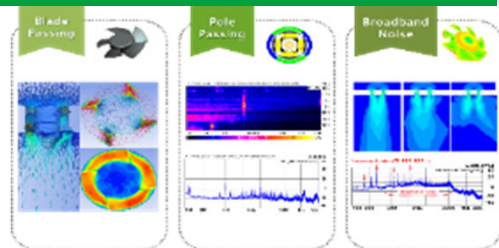
Energy Saving



Bionic Blade Design

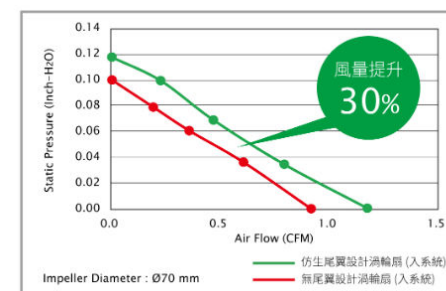


Low Noise



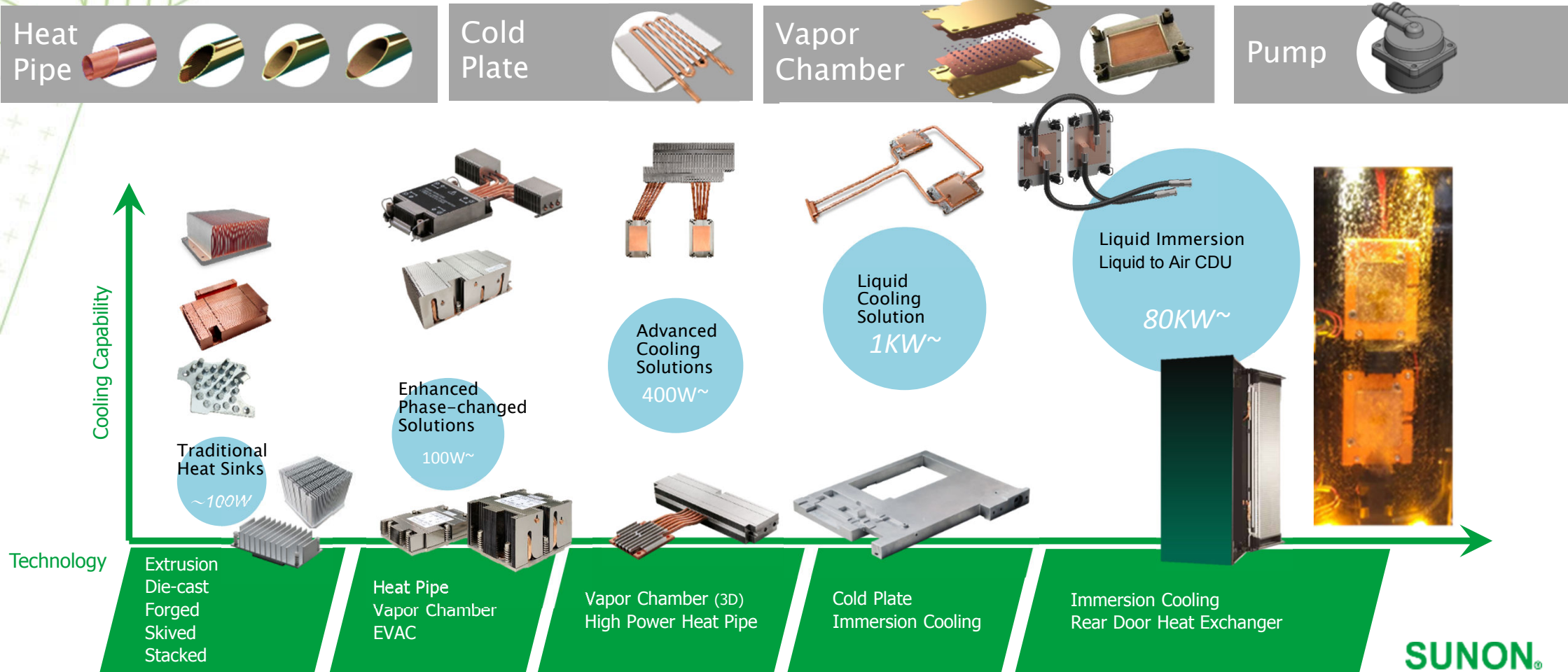
Reliability

- Salt solution: 0.05 % NaCl + 0.35 % ammonia sulphate (Flow is reduced to 20% of a normal ASTM G85 test)
- Chamber temperature: 35° C
- Test cycles first 35 days: 15 min. spray/fog followed of 45 min. drying. 3 day with Salt solution 2 days demineralized water
- Test cycles after 35 days: 30 min. spray/fog followed of 30 min. drying. 3 day with Salt solution 2 days demineralized water
- Test duration: 40 days
- Fans are running during the entire test
- Fans are checked once a day
- If Fan stops:
 1. Try to start fan with finger
 2. "Exercise" with pressurized air
 3. "Dry out" Fan in 45° C oven for 24 Hours.



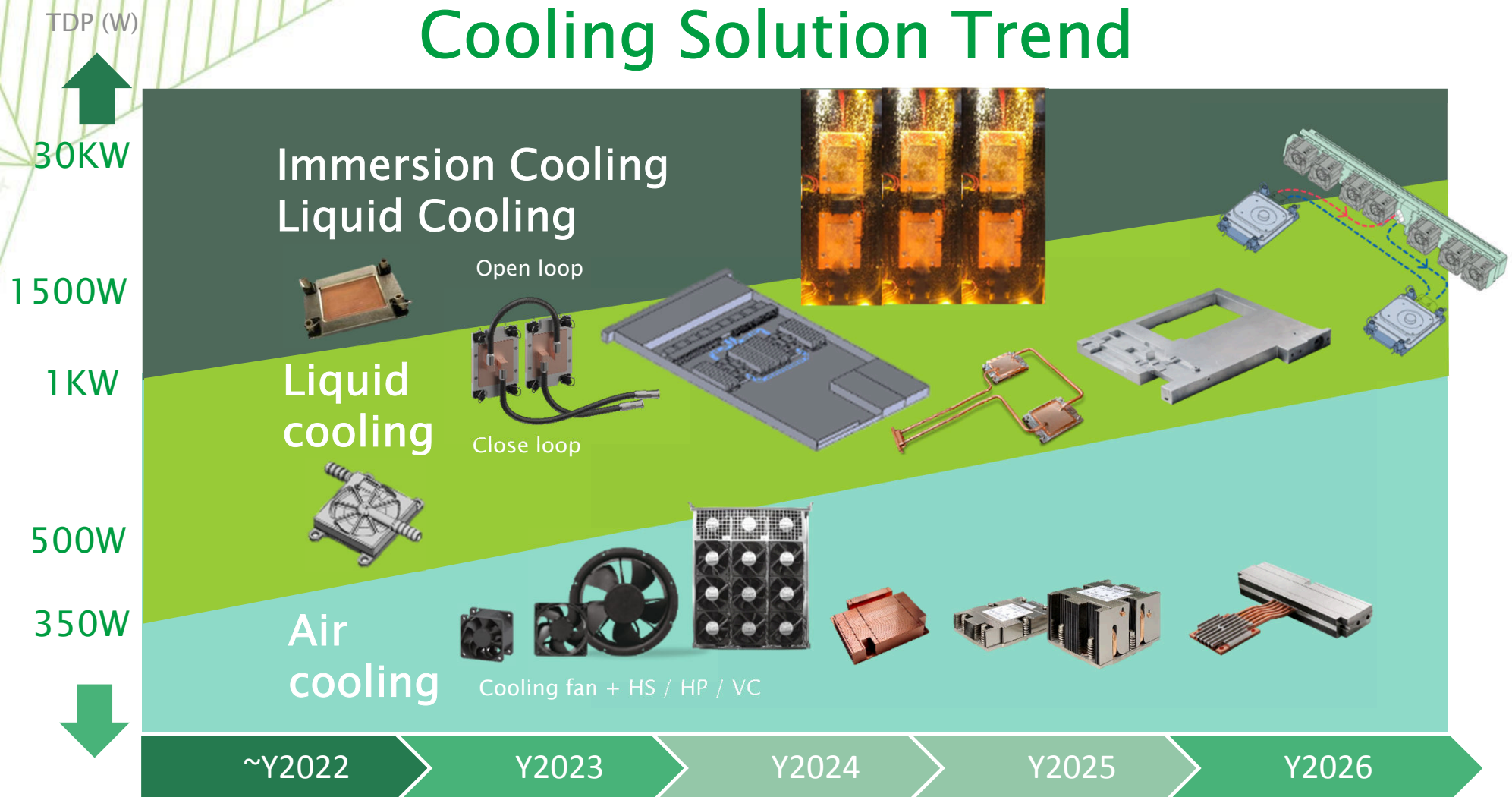
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More cooling options



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Cooling Solution Trend



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AI+5G → AI X 5G → Generative AI into daily life

The development of AI technology and the 5G network draw up a blueprint for Artificial Intelligence of Things (IoT). Numerous electronics and applications have been applied to build smart connections and rapidly adopted by various industries and into our daily life, and thus thermal needs are increasingly required.



5G

SERVER

DATA
CENTER

Vehicle
Computing

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Fan is still the key component for Liquid cooled AI

NVIDIA	Single B200 GB200 NVL72	B200 DGX/HGX	B100 HGX	H200 SXM	H100 SXM
GPU architecture	Blackwell			Hopper	
TDP	1200W	1000W	700W	700W	700W
Cooling	Liquid Cooling	Air Cooling	Air Cooling	Air Cooling	Air Cooling

Estimated # of fans used for GB200 NVL72

Rack: 6-8cm dual fan*8 each tray, total #18 computer trays;

NV Link Switch: 4cm dual fan*7 each tray, total #9 trays

Power Supplies: at least #50 fans

In-rack system: Up to #257 cooling fans applied

At lease #16 200mm Axial fans installed in RDHx



Picture Source : Internet

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Data Center Thermal Layout

Existed Data Center

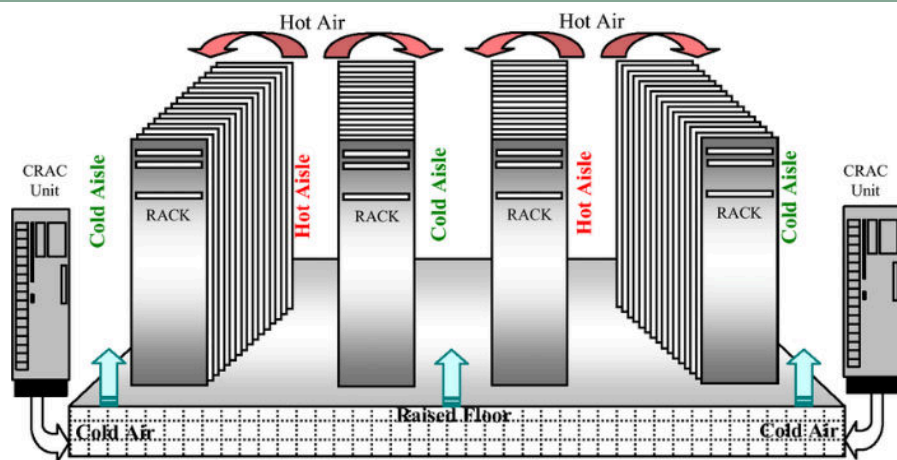
Existed CRAC system (Compute Room Air Conditioner)

Air-cooling

Fan + 3DVC → Hot air

Liquid cooling (Liquid to Air)

Cold Plate → Sidecar/RHDx → Hot air



Layout of racks and CRAC in a data center

New Data Center

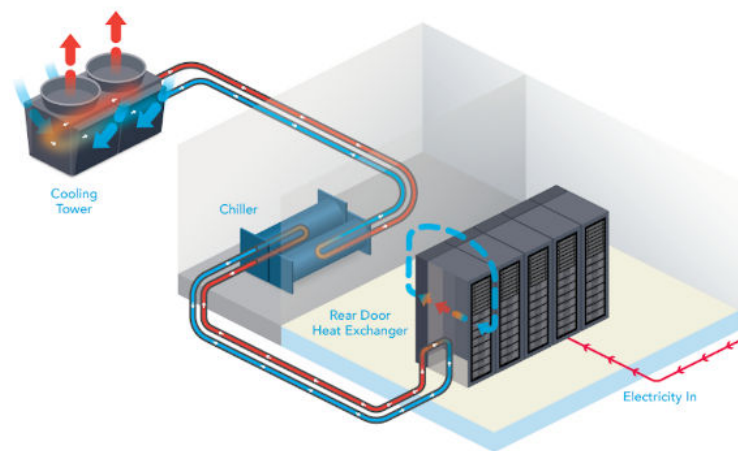
Extra chiller and/or cooling tower

Liquid cooling (Liquid to Liquid)

Cold Plate → Chiller → Hot water

Immersion cooling (Liquid to Liquid)

Boiler/Heatsink → Chiller → Hot liquid



Picture Source : Internet

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Air Cooling vs. Direct Liquid Cooling

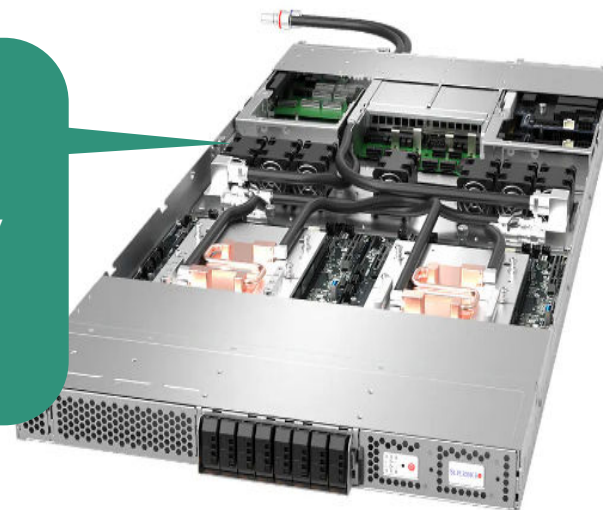
Air Cooling (Fan + 3DVC)

Refer to MGX platform
SMCI model ARS-111GL-NHR



Direct Liquid Cooling (Fan + Cold Plate)

Refer to MGX platform
SMCI model ARS-111GL-DNHR-LCC



For same chassis layout, fan is must needed key component for thermal solution

Picture Source : Internet

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Air Cooling vs. Direct Liquid Cooling

Direct Liquid Cooling (Fan + Cold Plate)

Refer to HGX platform
SMCI model SYS-421GE-TNHR2-LCC



Fan is must needed key component for thermal solution (DDR5, PCIe)

Picture Source : Internet

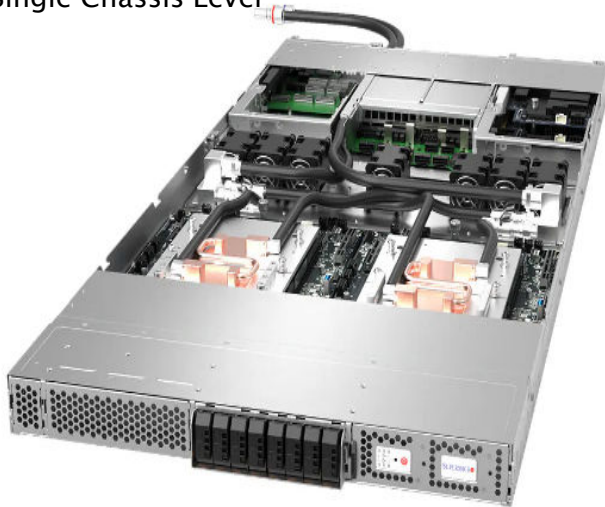
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Air Cooling vs. Direct Liquid Cooling

Direct Liquid Cooling (Fan + Cold Plate)

Refer to MGX platform
SMCI model GPU ARS-111GL-DNHR-LCC

Single Chassis Level

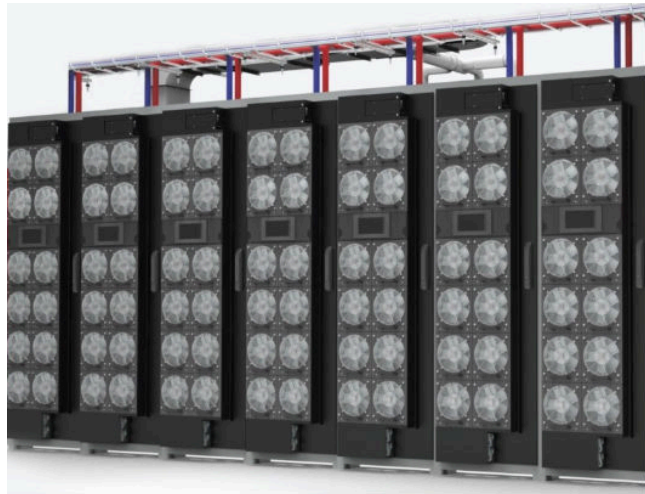


Picture Source : Internet

Rear Door Heat Exchanger

Larger axial fan

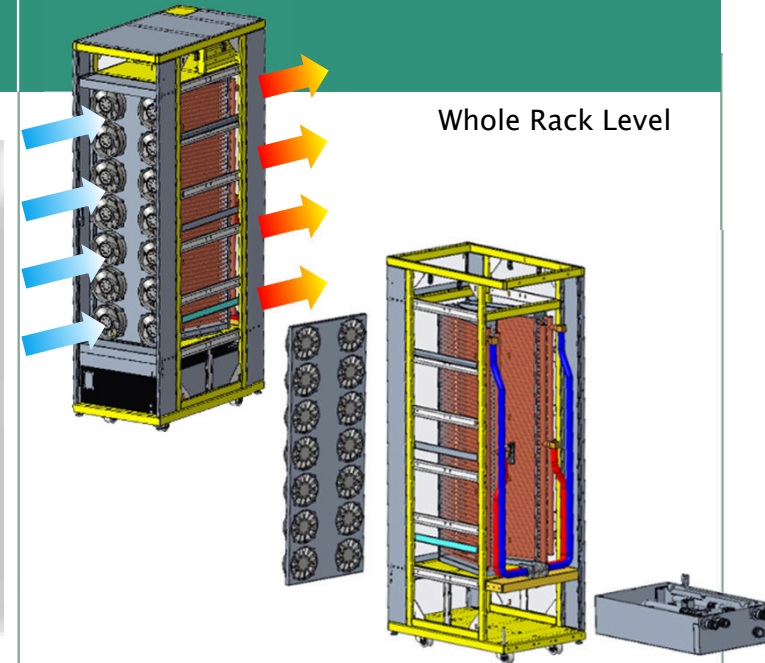
Whole Rack Level



Sidecar

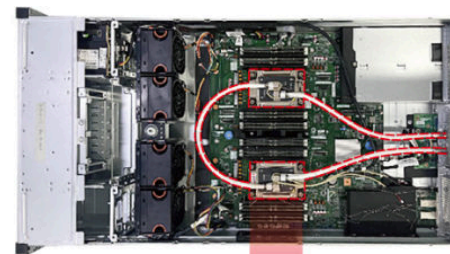
Air Assisted Liquid Cooling
(Larger axial fan)

Whole Rack Level

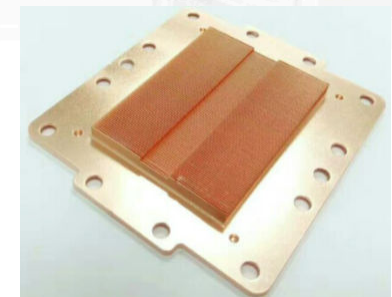


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Cold Plate Business for Liquid Cooling



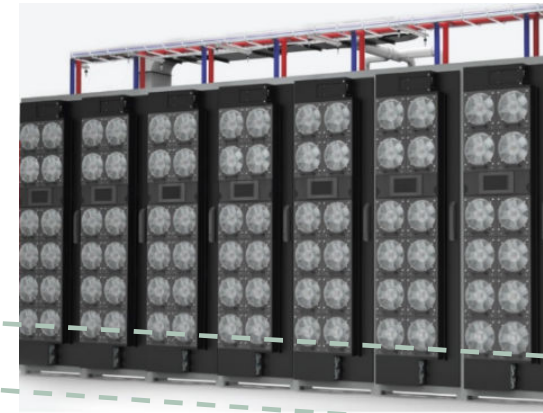
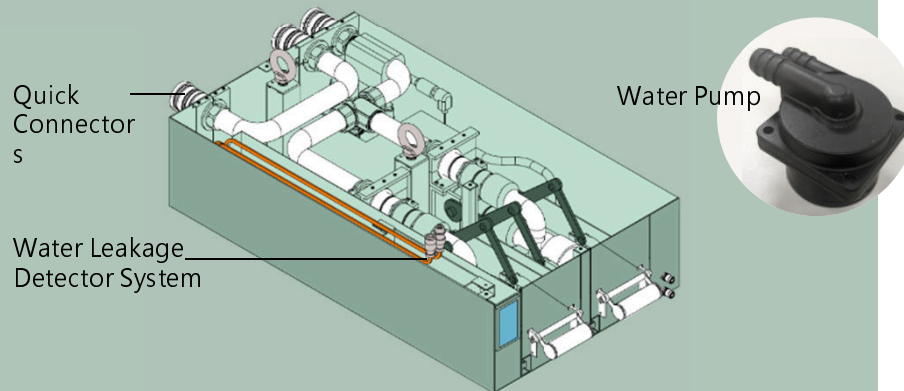
SUNON DLC



SUNON Cold Plate **SUNON®**

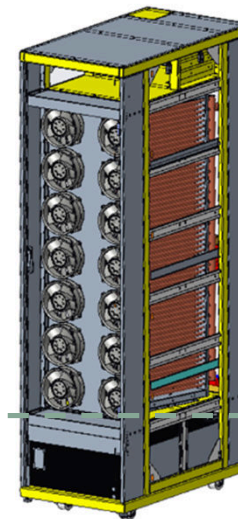
Pump Business for Liquid to Air Cooling

SUNON RPU (80~120LPM)
Reservoir and Pumping Unit



Picture Source : Internet

SUNON RPU
Reservoir and Pumping Unit

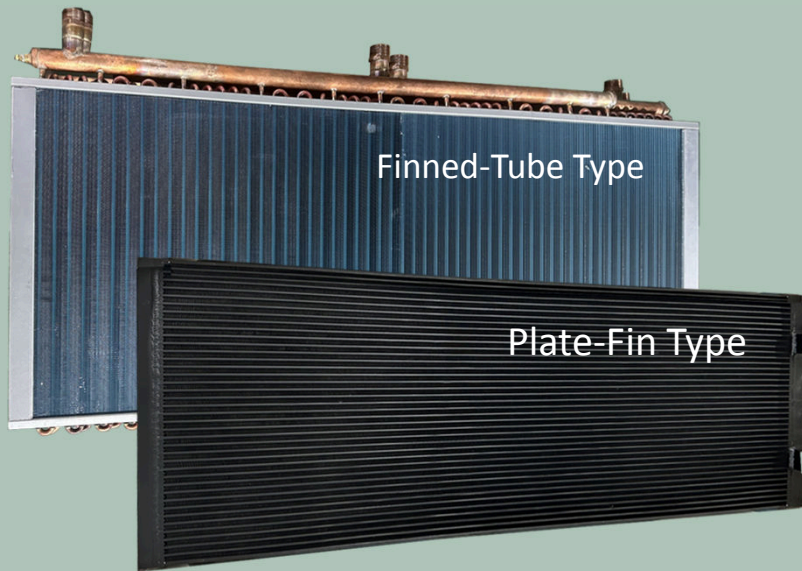


Sidecar
Air Assisted Liquid Cooling
(4U RPU)

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Heat Exchanger Business for Liquid to Air Cooling

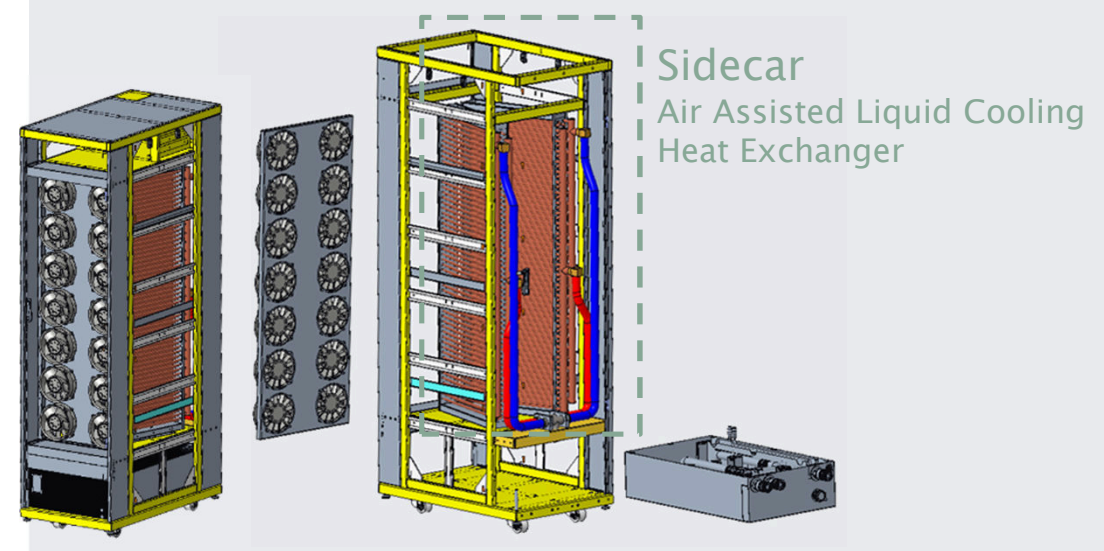
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Liquid Cooling Heat Exchanger



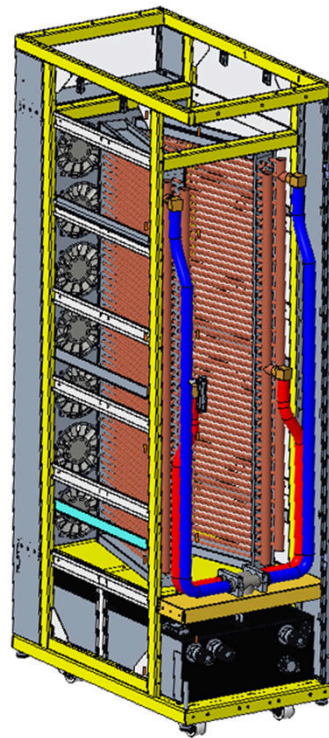
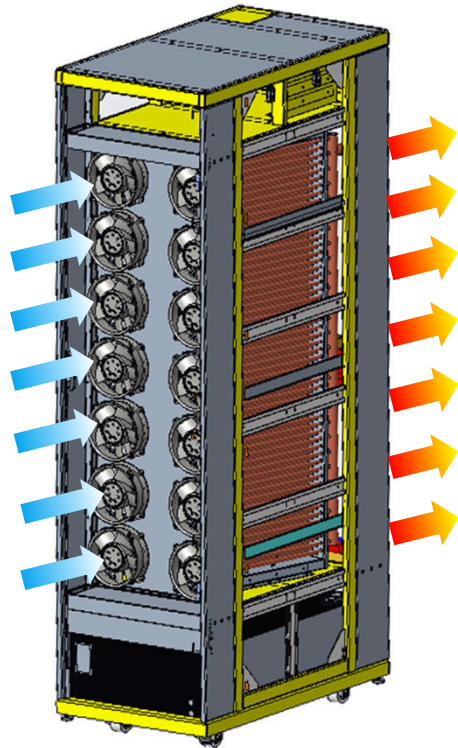
Rear Door
Heat Exchanger



Picture Source : Internet



Rack-level Liquid Cooling Products



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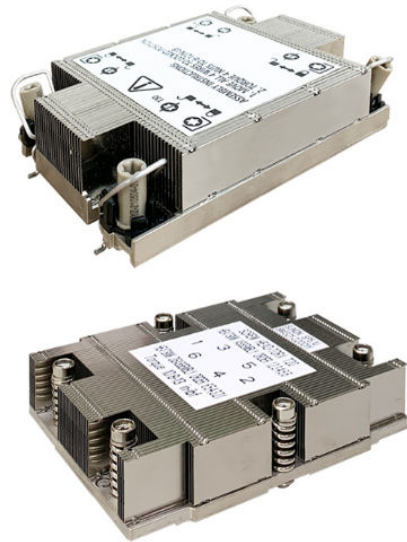
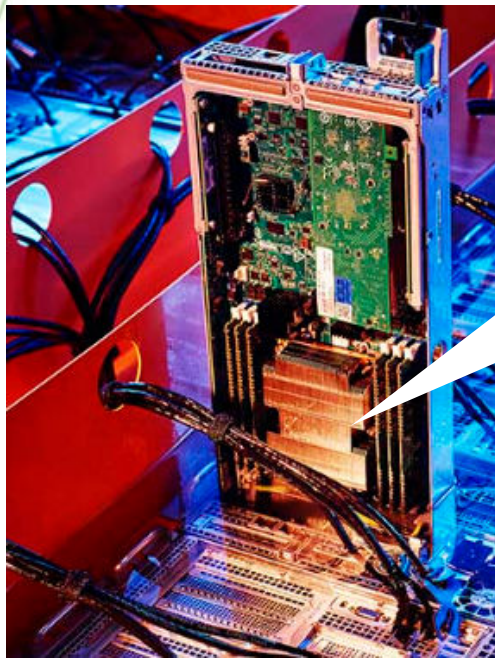
60~80kW AALC

Air Assisted Liquid Cooling
Sidecar

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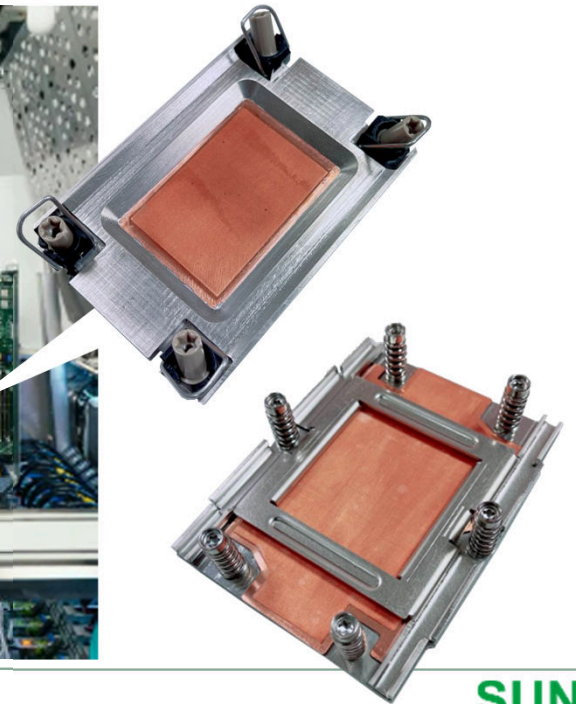
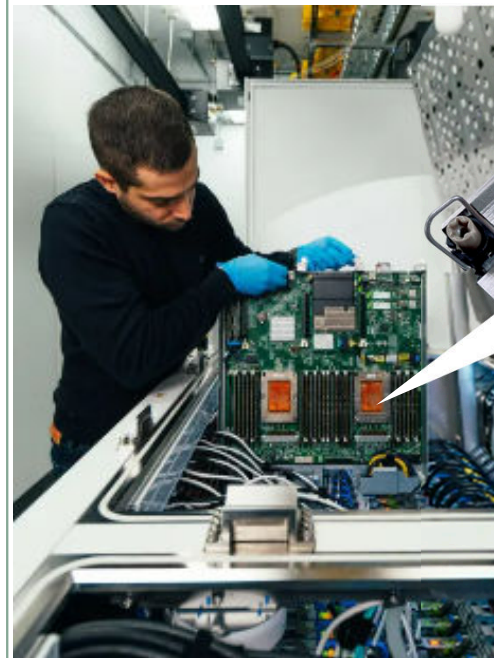
Cooler Business for Immersion Cooling

SUNON Heatsink single-phase immersion cooling



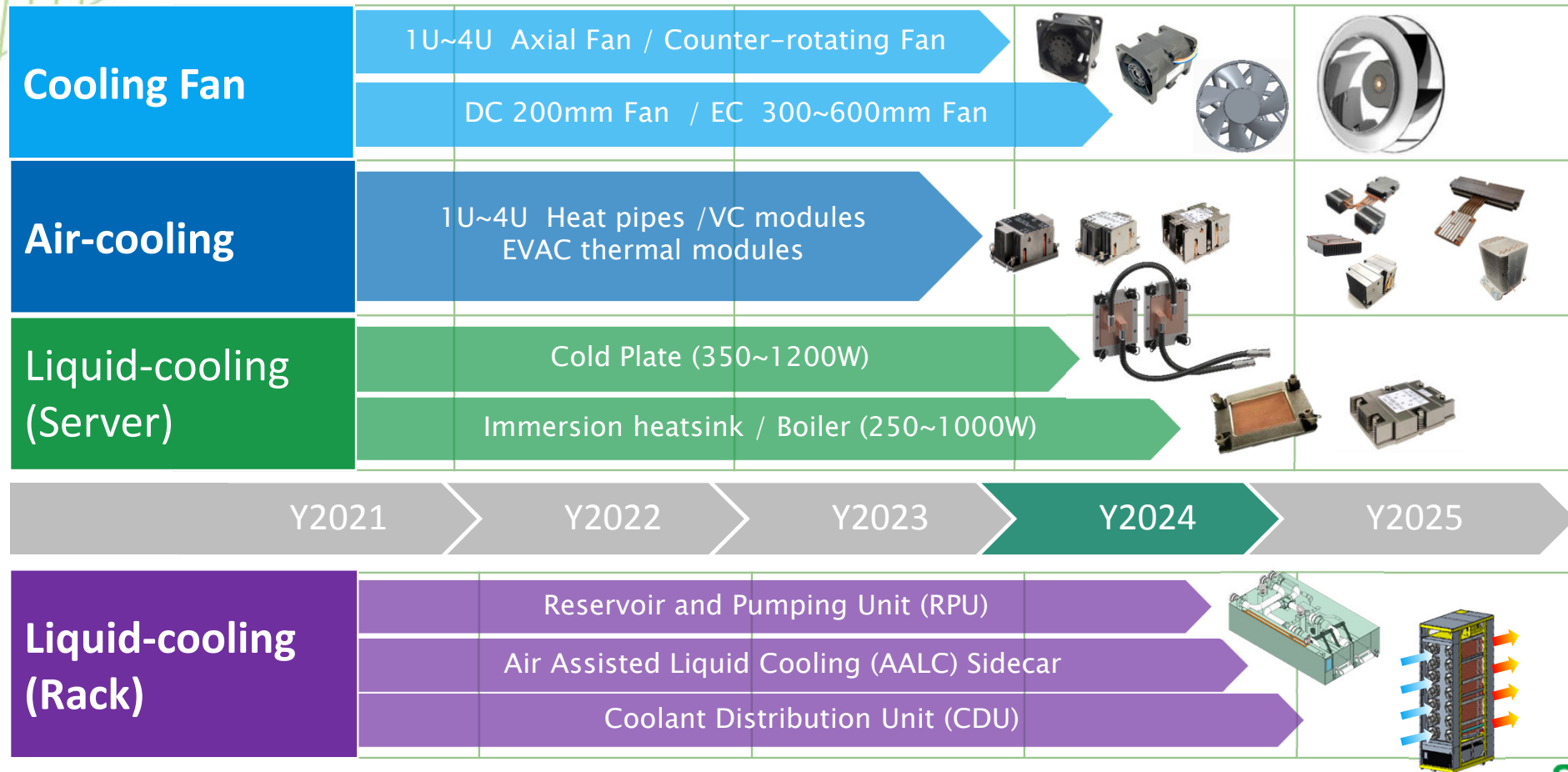
Picture Source : Internet

SUNON Boiler two-phase immersion cooling






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SUNON Product Roadmap

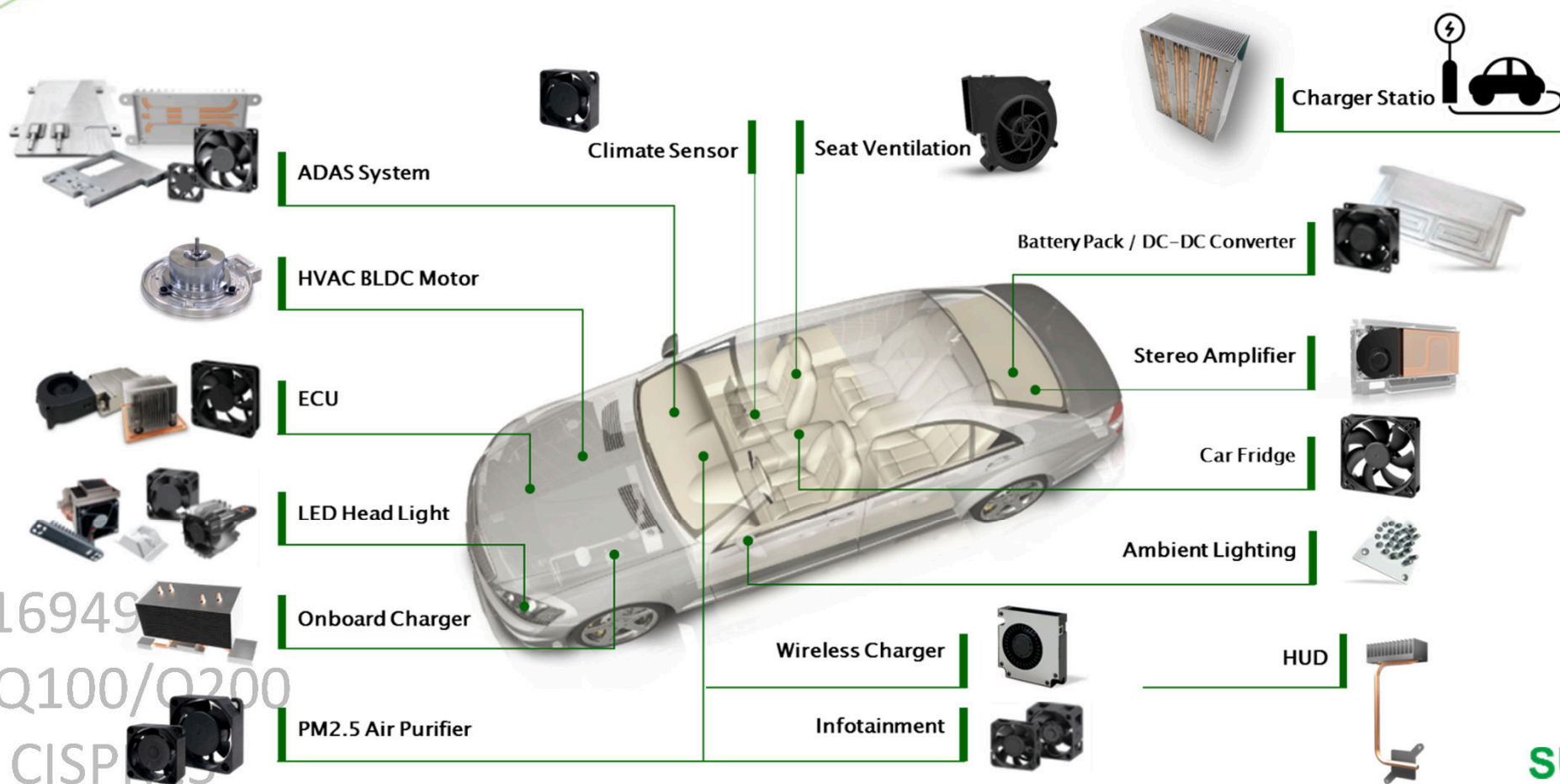


SUNON Key Plan for Liquid Cooling

	2024Q1	2024Q2	2024Q3	2024Q4
 Sidecar Lab		90kW standard performance tester (will finish@Sep)		
 Human Resource		Dedicated liquid cooling team x 2 (will finish@ Dec)		
 Customer Approach		Key account customer visiting Share newest product in OCP Global Summit (@Oct)		

Electric Vehicles / Auto Cooling Solution

SUNON has more than 20 years of experience in cooling solutions for the automotive industry, and can provide various cooling fans, cooling modules and liquid cooling products that meet the quality standards of the automotive industry



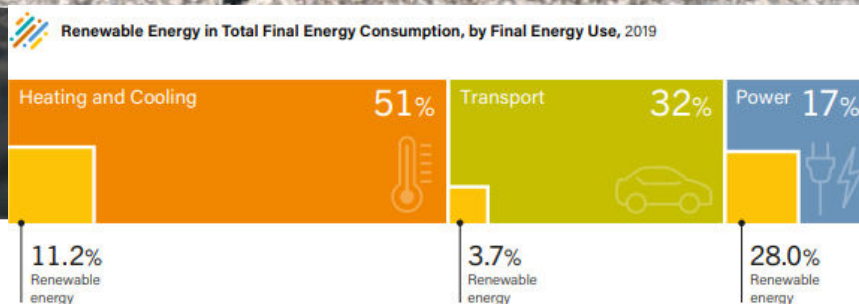
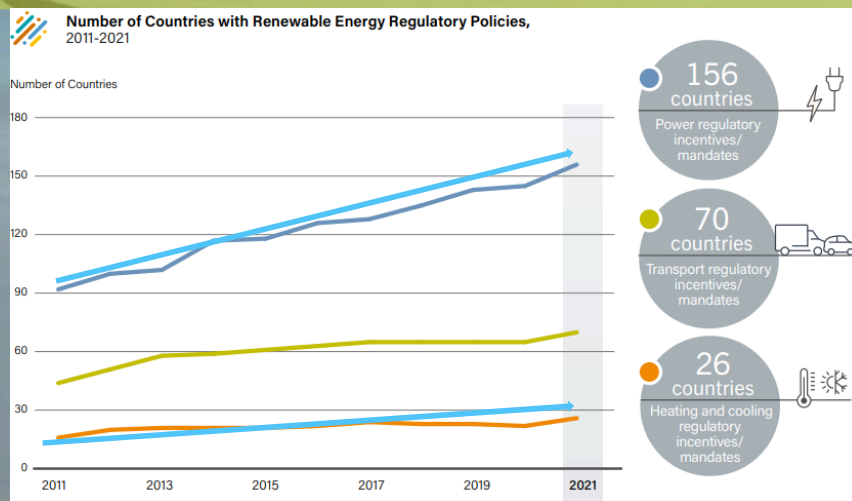
IATF16949
AEC Q100/Q200
EMC CISPR25

SUNON®

Net zero emissions by 2050

Energy Transition Energy Transition Business Opportunities

Having an excellent thermal system is the key to stably maintain the operation of energy storage systems. Selecting an optimal thermal solution ensures the operation stability and high system effectiveness, and it also minimizes unnecessary maintenance costs.



Source: <https://reurl.cc/NR85xk>

PV inverters
Enclosure cabinet equipment
EV charging systems

Energy storage systems
Battery containers,
packs and racks

SUNON®

Renewable Energy Cooling Solution

SUNON is an important partner of global high-quality energy system cooling solutions, providing a full range of cooling solutions.

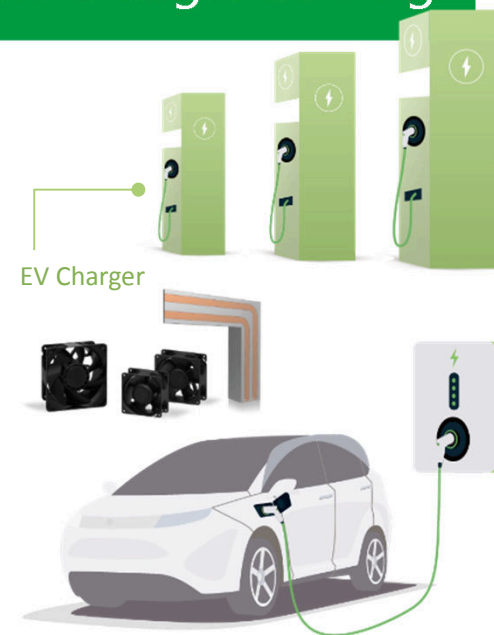
PV Inverter Cooling



ESS Cooling



EV Charger Cooling



SUNON®



Established

1980



Employees

8420



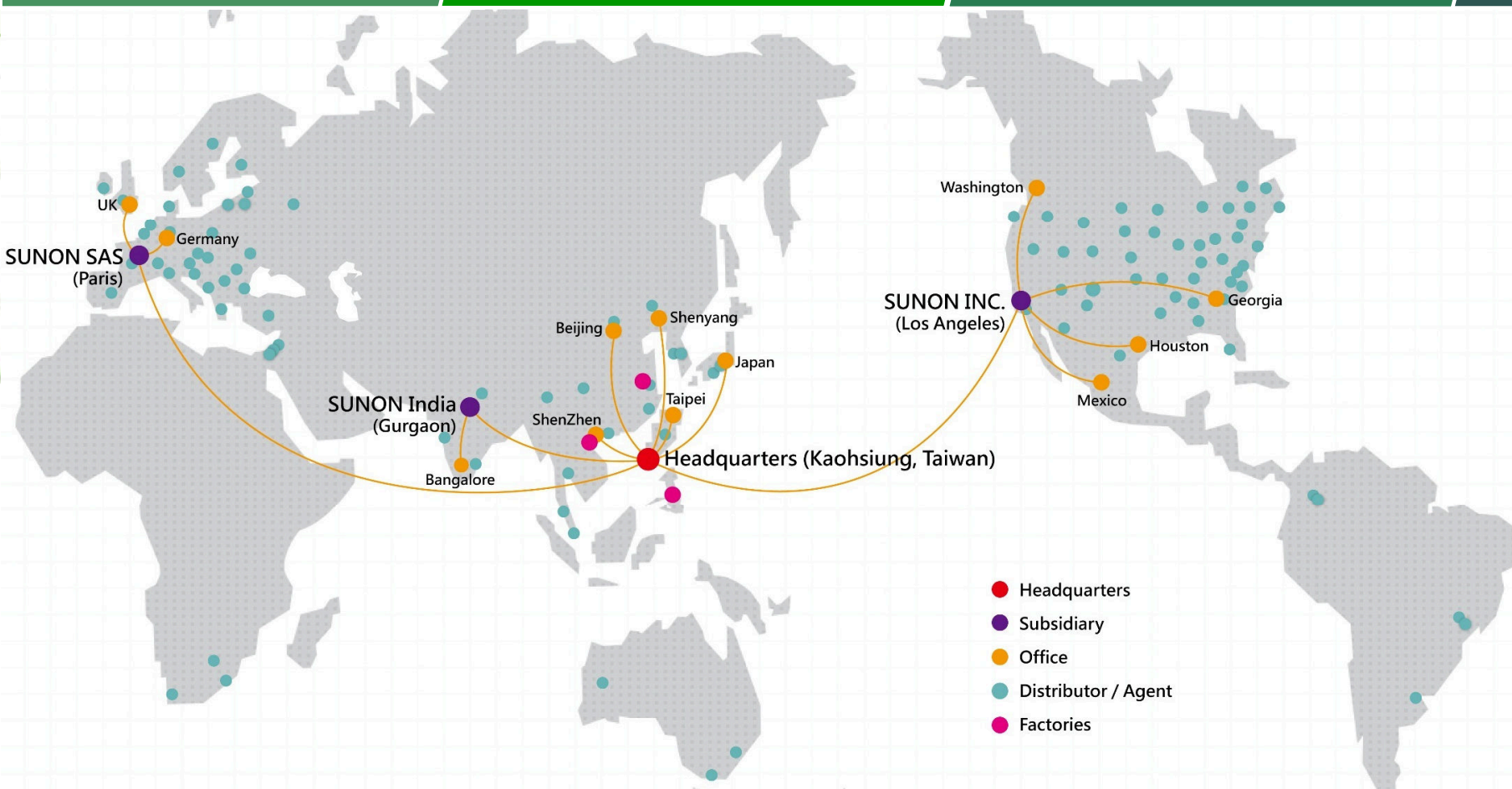
Turnover (USD)

414.1 M



Factories

5



14

Subsidiary & Office

130

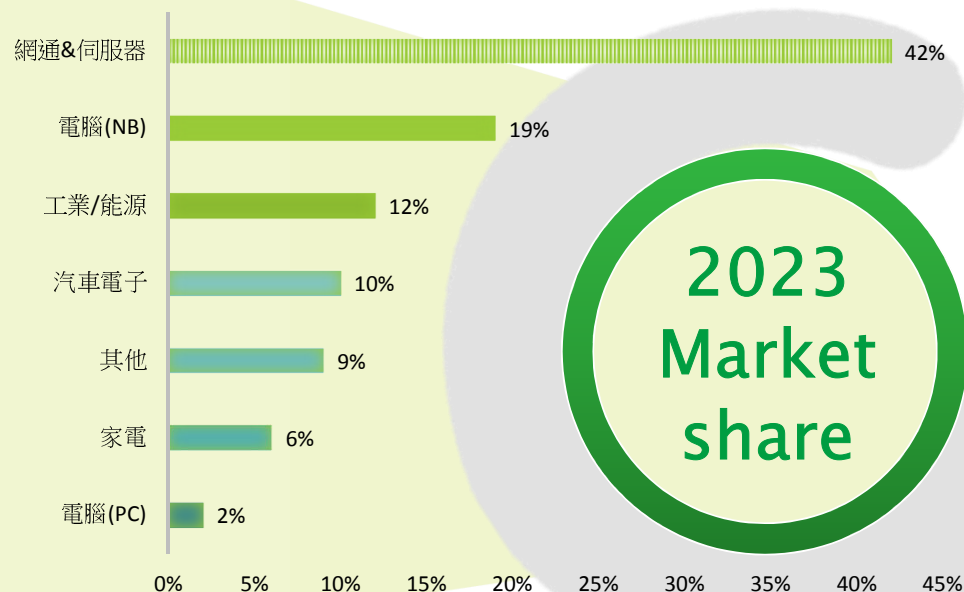
Distributor & Agent

1000+

Sales & Service sites

SUNON®

Products and Applications



Fan and Motor

Air Flow Management

SUNON concentrated on its core motor technology and accumulated various inventions and innovations in this field. We now provide various sizes of motor and fan which featuring higher flexibility, energy-efficiency, lower noise, and longer service life.

2023
Market
share

Air / Liquid Cooling Module

Total Thermal Solution

As a world-renowned cooling leader, we can provide customized and integrated service to our clients easily base on sophisticated experience and innovative technology.

HVLS Fan

Optimal air Circulation

It features an ultra slim motor and a stylish shape. The patented silent winglet design, energy efficient and high airflow fan creates thermal comfort and healthy environment.

SUNON
Products

Air Exchanger

Total Air Fresh Solution

It implies a demand for craftsmanship and minimalist beauty in German design and creates an all-new experience in clean air quality for the new generation of healthy homes.

SUNON®

Sufficient Capability

production bases
Cooling Fans
19 M pcs/ month
Cooling Module
2.68 M pcs/month



Kaohsiung, Taiwan
1M pcs /month



Beihai, Guangxi
(A Building 、 B Building)
Fans 7.2M pcs/month



Beihai, Guangxi
(C Building)
Fans 2.7M pcs/month



Kunshan, Jiangsu
5.3 M pcs/month(FAN)
2.5 M pcs/month(CM)



Bataan, Philippines
2.8 M pcs/month
180 K pcs/month(CM)

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EGS Performance Highlights

Society

- Average employee training hours exceeded **66.8 hours** per year.
- Production bases in Taiwan and China have both passed ISO 45001 certification.
- Provided **care to 8,060 households** in the "Support and Care Campaign" from 2018 to 2022.

Environment

- Implemented **greenhouse gas inventory across** the entire group, and passed third-party external verification.
- The solar power generation of the Guangxing plant has exceeded **455,000 kWh**.
- Continuously passed IECQ QC 080000 certification each year.

Governance

- Consolidated revenue reached **14.063 billion NTD**, a 3.7% increase from 2021.
- The Company ranks among the **top 3 leading brands** in terms of market share.
- **Female directors account for 1/3** of the seats on the board of directors.
- A sustainability development committee has been established.
- **Zero cases** of corruption.

Products

- **Saved 318 million kWh** of electricity with product R&D. Reduced GHG emissions by 160,000 MTCO₂e.
- **100.0% pass** rate of hazardous substance inspection for three consecutive years from 2020 to 2022.
- Obtained **3,332 invention patents**.

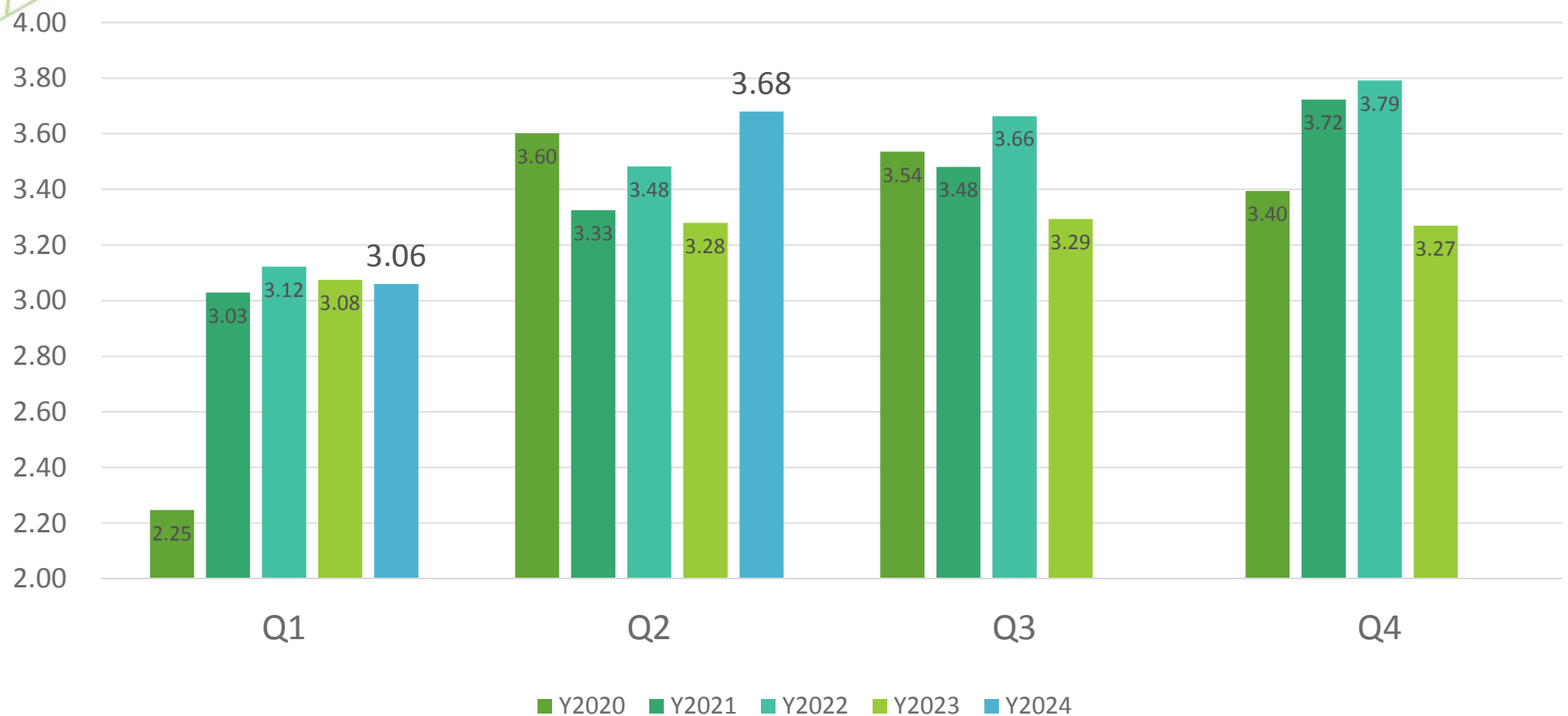
Supply Chain

- Implemented audits for new suppliers.
- Conducted annual supplier audits.
- **Local procurement rates exceed 90%.**

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Quarterly Revenue

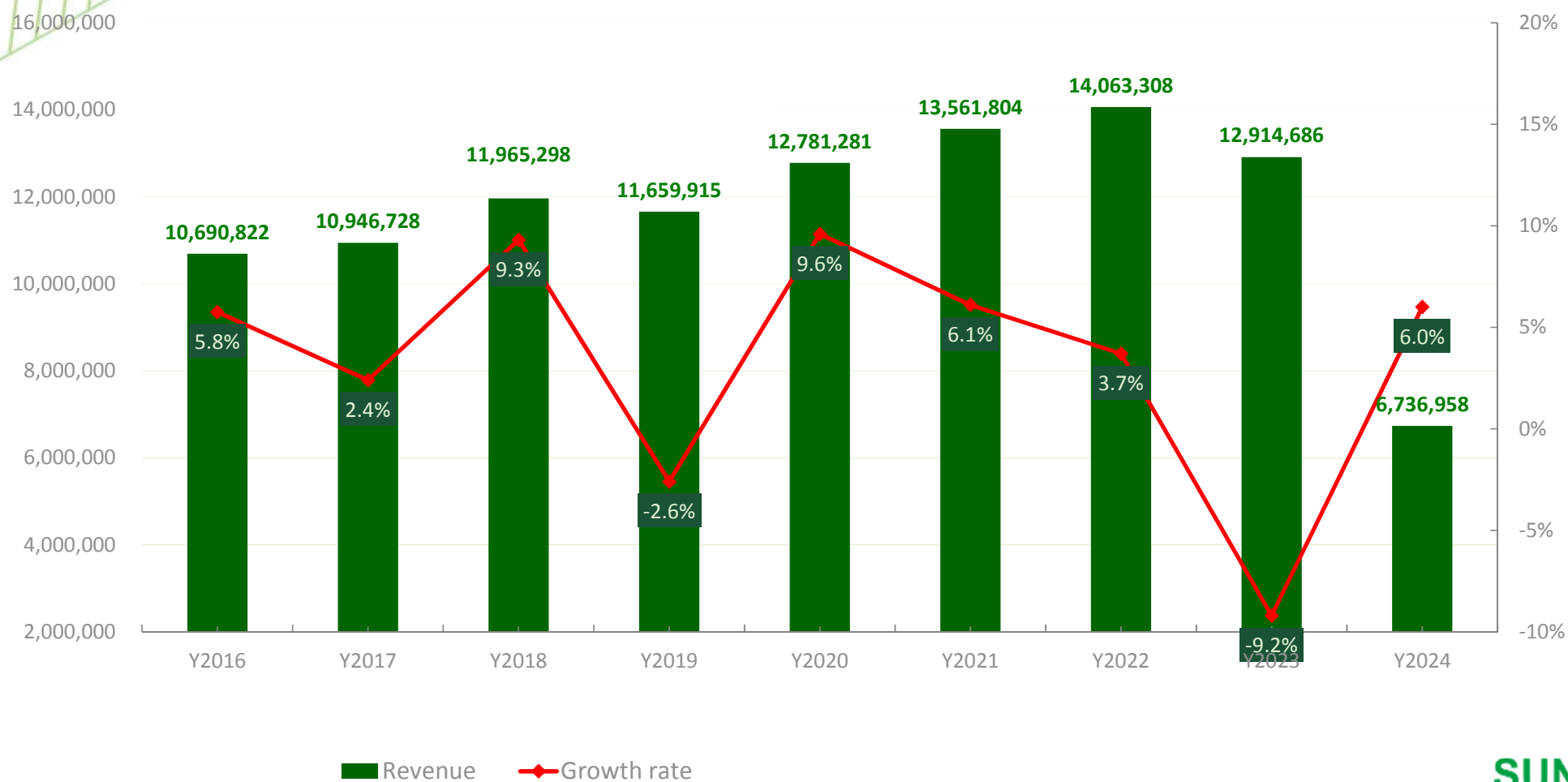
In B. NT



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Revenue Performance

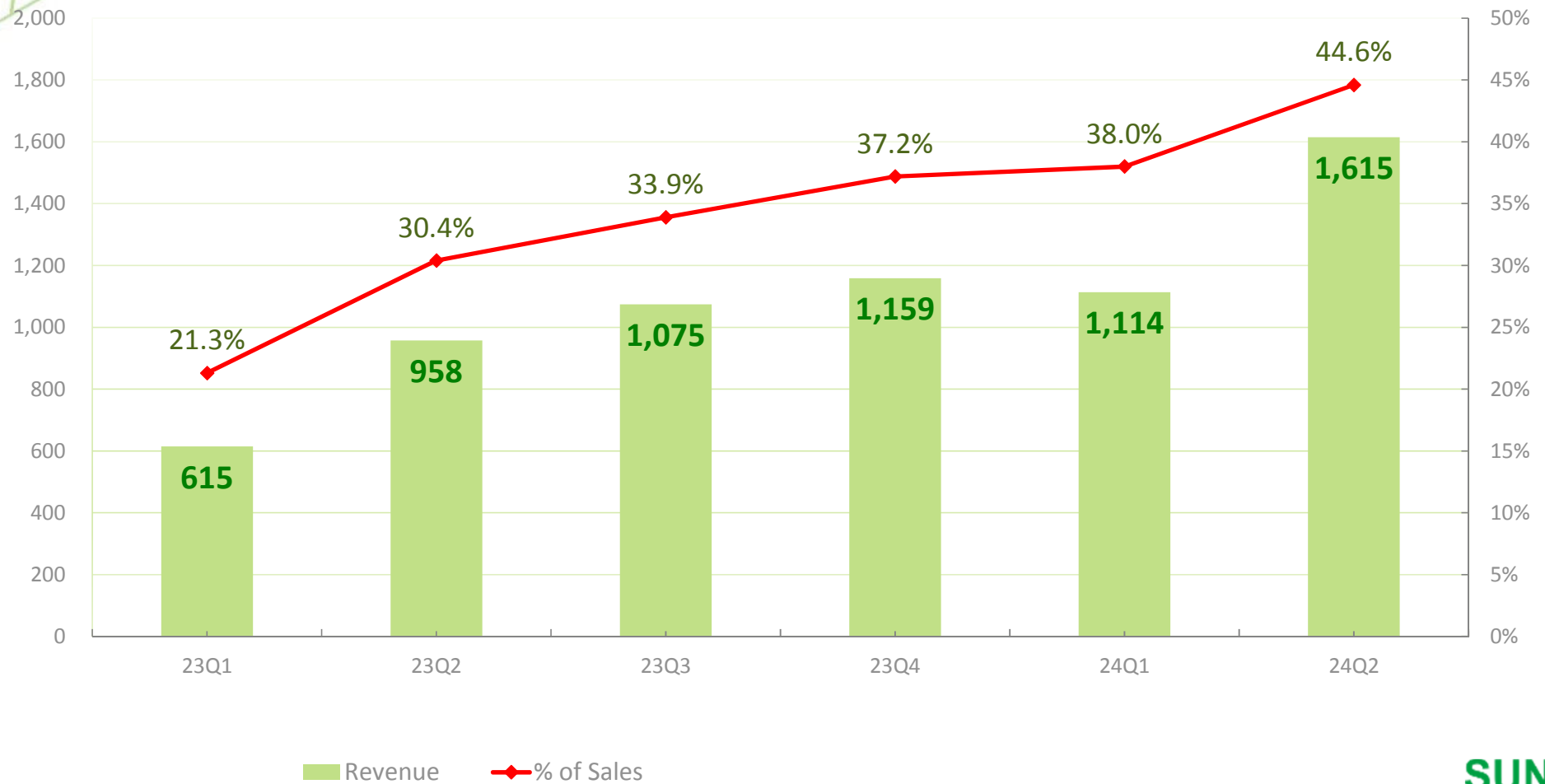
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Quarterly Revenue in Server

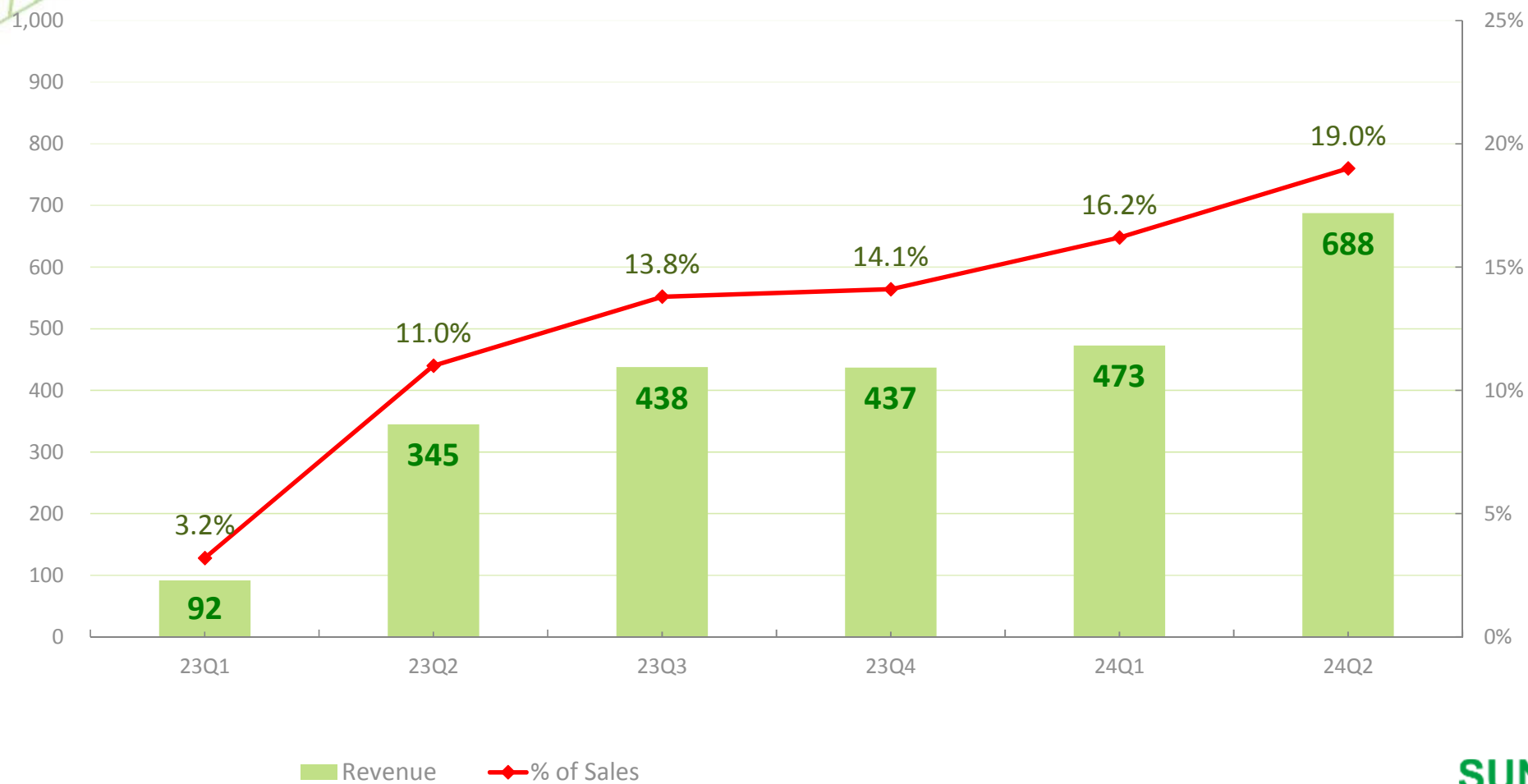
UNIT: NTD (M)



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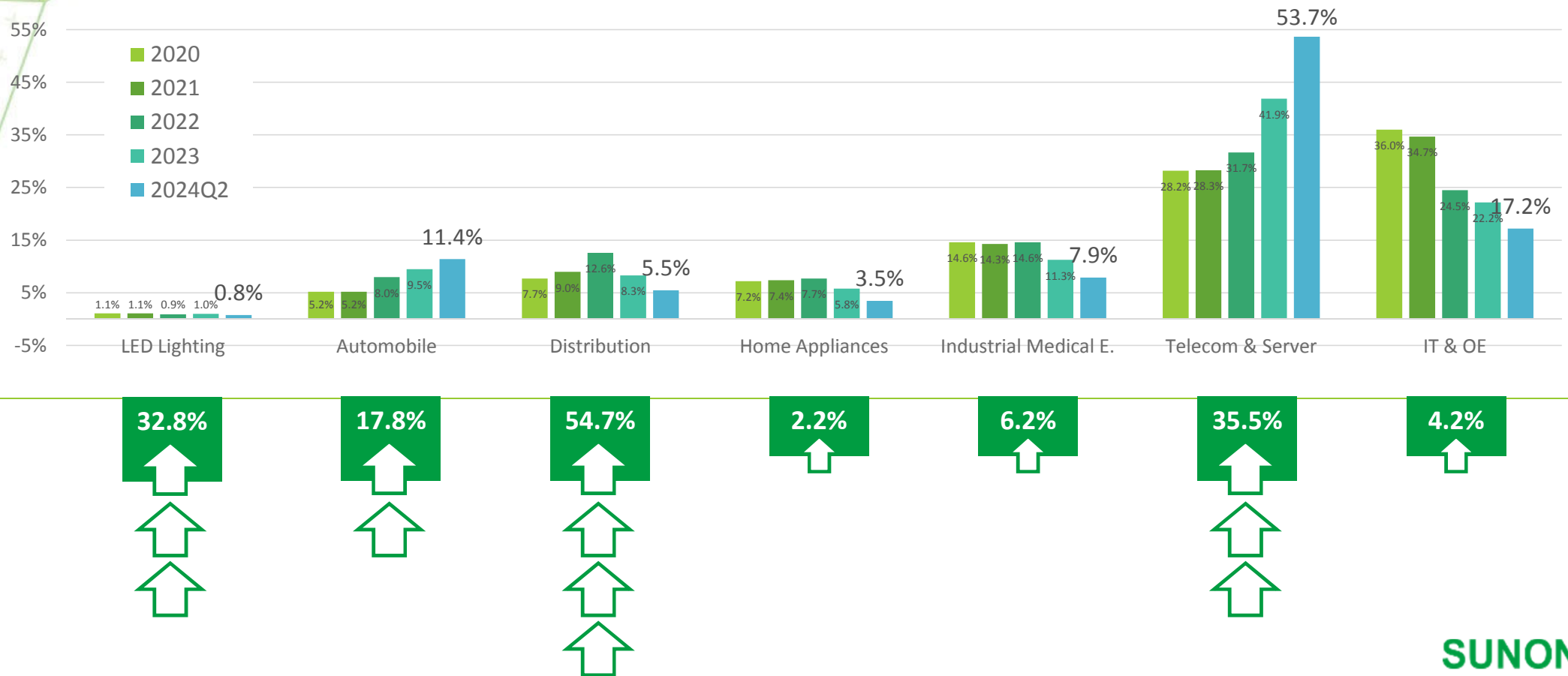
Quarterly Revenue in AI Server

UNIT: NTD (M)



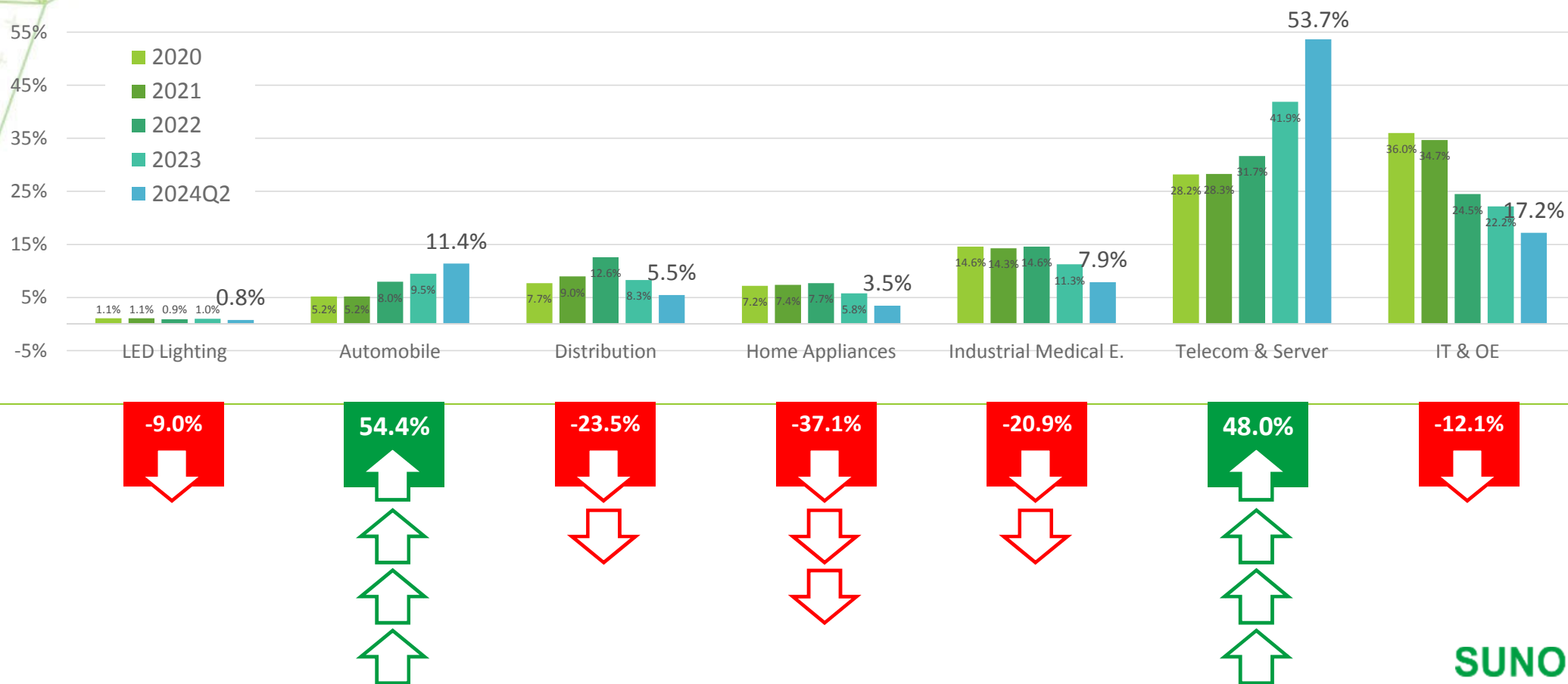
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Products Application & QoQ Growth



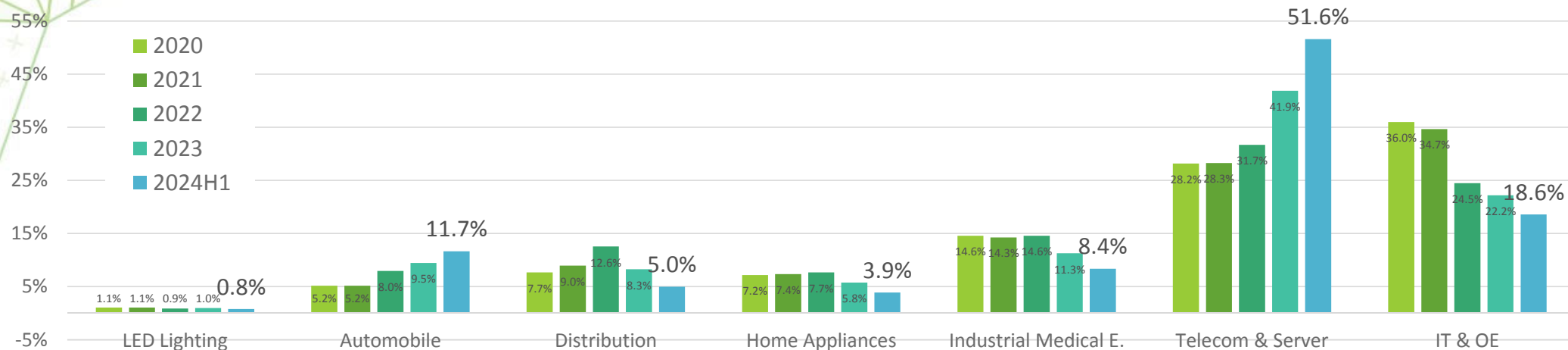
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Products Application & YoY Growth



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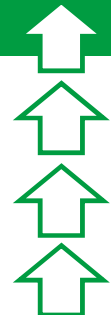
Products Application & YoY Growth



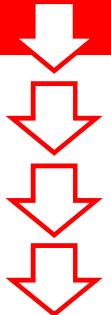
-25.8%



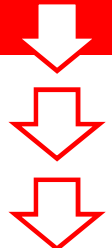
49.7%



-49.0%



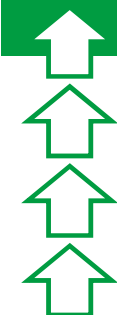
-36.8%



-27.9%



46.6%



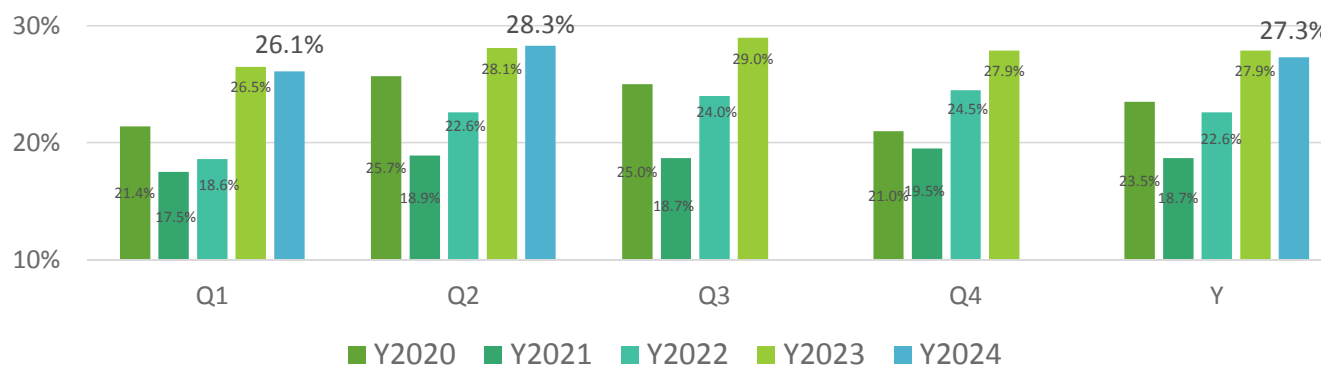
-8.9%



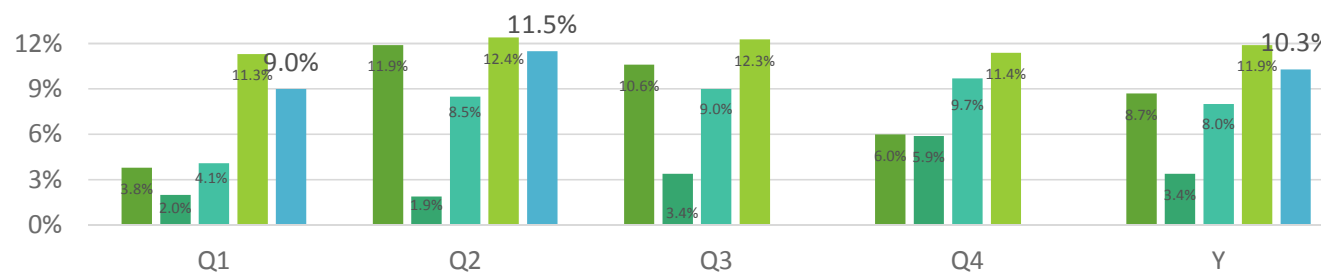
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Profit Margin

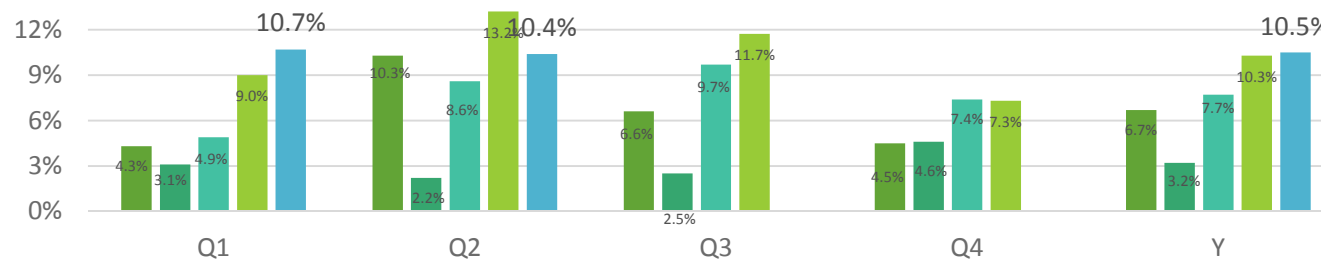
Gross Margin



Operating Margin



Net Margin



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Quarterly Earning

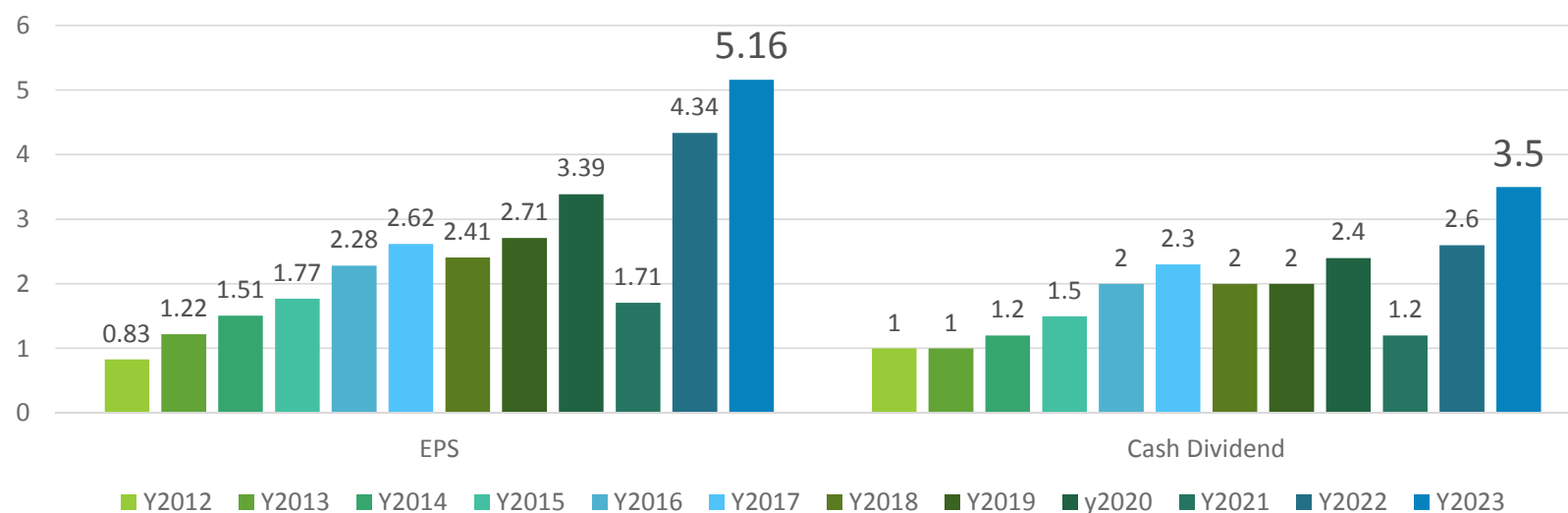
In NTD



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Earning & Cash Dividend

UNIT: NTD



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Payout R.	81.97%	79.47%	84.75%	87.72%	87.79%	82.99%	73.80%	70.80%	70.18%	60.00%	67.80%

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Appendix I

CONSOLIDATED BALANCE SHEETS					
NT\$ M	2024.6.30	2023.12.31	2023.6.30	Change(%)	
				vs. 2023.12.31	vs. 2023.6.30
TOTAL ASSETS	14,706	12,615	12,277	16.6%	19.8%
Cash	4,926	4,031	3,281	22.2%	50.1%
A/R, N/R	3,757	3,079	3,197	22.0%	17.5%
Inventories	2,168	2,052	2,210	5.7%	-1.9%
PP&E	2,321	2,171	2,175	6.9%	6.7%
TOTAL LIABILITIES	7,604	5,396	6,796	40.9%	11.9%
Short-term loans	769	458	776	67.9%	-0.9%
A/P	3,166	2,737	2,285	15.7%	38.6%
Long-term loans	553	213	325	159.6%	70.2%
TOTAL EQUITY	7,102	7,219	5,481	-1.6%	29.6%
Days sales outstanding	93	92	95		
Days sales of inventory	77	92	96		
Current Ratio	1.72	2.03	1.86		

Appendix II

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME						
NT\$ M	2024 Q2	2023 Q2	2024 H1	2023 H1	YOY(%)	
					2024Q2	2024H1
OPERATING REVENUES	3,677	3,280	6,737	6,355	12.1%	6.0%
GROSS PROFIT	1,039	923	1,839	1,737	12.6%	5.9%
OPERATING EXPENSES	619	516	1,144	982	20.0%	16.5%
INCOME FROM OPERATIONS	420	407	695	755	3.2%	-7.9%
NON-OPERATING INCOME AND EXPENSES	134	132	274	149	1.5%	83.9%
INCOME BEFORE INCOME TAX	553	539	969	903	2.6%	7.3%
NET INCOME attribute to owners	379	432	706	710	-12.3%	-0.6%
EPS (NT\$)	1.39	1.72	2.58	2.83		
Gross Margin	28.3%	28.1%	27.3%	27.3%		
Operating Margin	11.5%	12.4%	10.3%	11.9%		
Net Margin(*)	10.4%	13.2%	10.5%	11.2%		

(*)Net Margin=Net Income attribute to owners / Revenue



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