



Generative AI and Data Center Related Business

(Overview & Panasonic Energy's business field)

November 27, 2024

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- Notes: 1. This is an English translation from the original presentation in Japanese.
2. In this presentation, "Fiscal 2025" or "FY3/25" refers to the fiscal year ending March 31, 2025.





Agenda

1. Market Environment and Business Opportunities for the Panasonic Group
2. Panasonic Energy's Initiatives

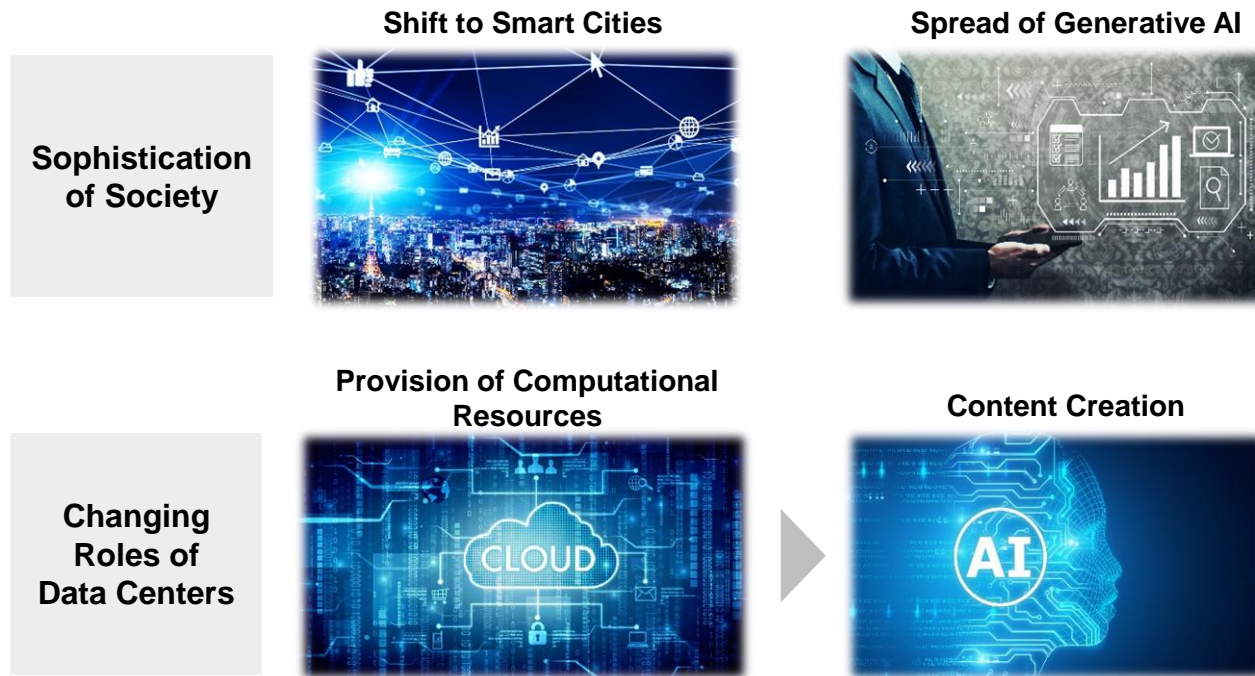
1-1. Market Environment

Data Centers, vital for societal progress, are set for exponential future growth

The Role of Data Centers in Digital Society

The progression of digital and AI technology has brought about significant changes in society and individuals' lives

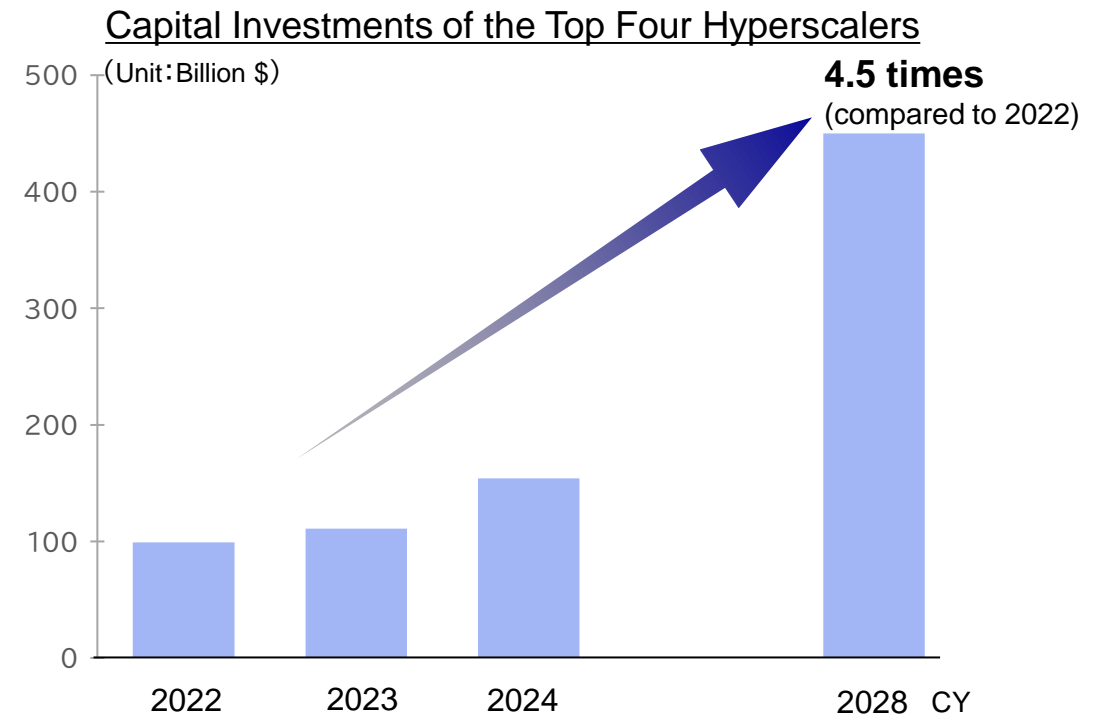
The importance of data centers has dramatically increased, transitioning from being communication hubs to becoming the brain of AI



Market Size

Hyperscalers are expanding their investments globally

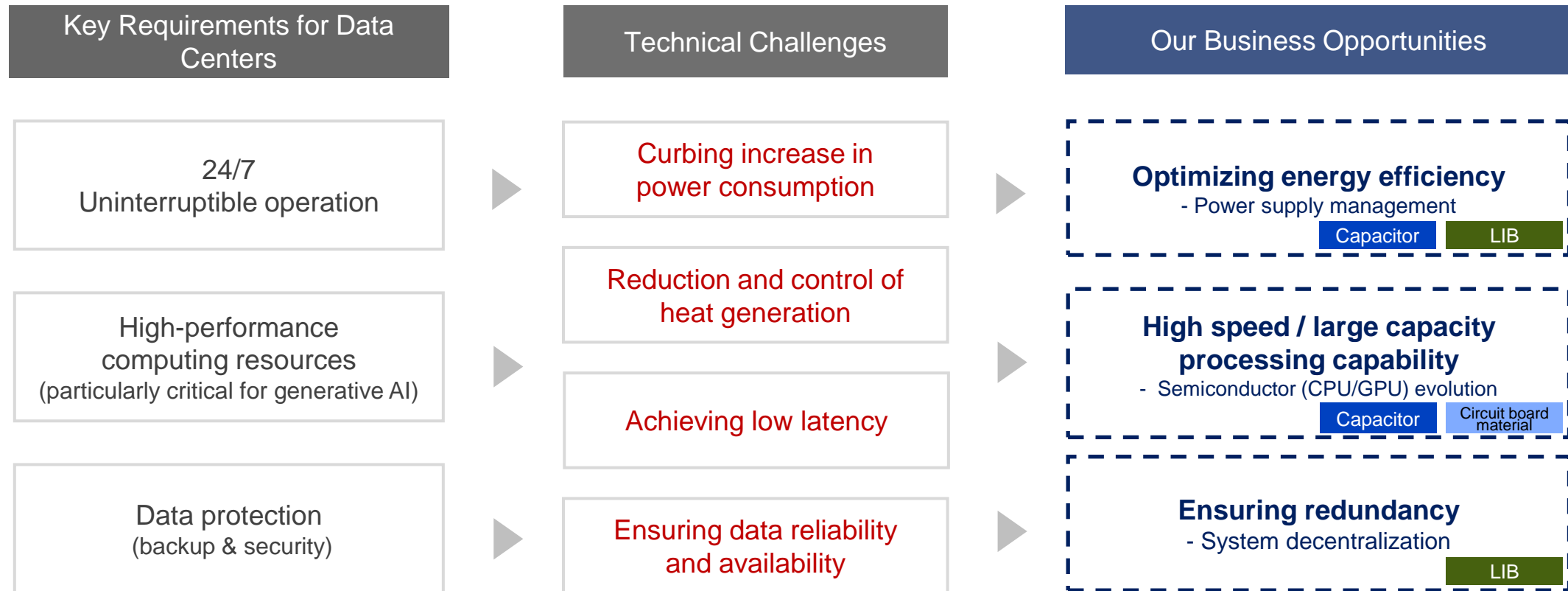
Hyperscalers: Cloud service providers with large-scale servers



Source: Dell'oro

1-2. Business Opportunities for the Panasonic Group

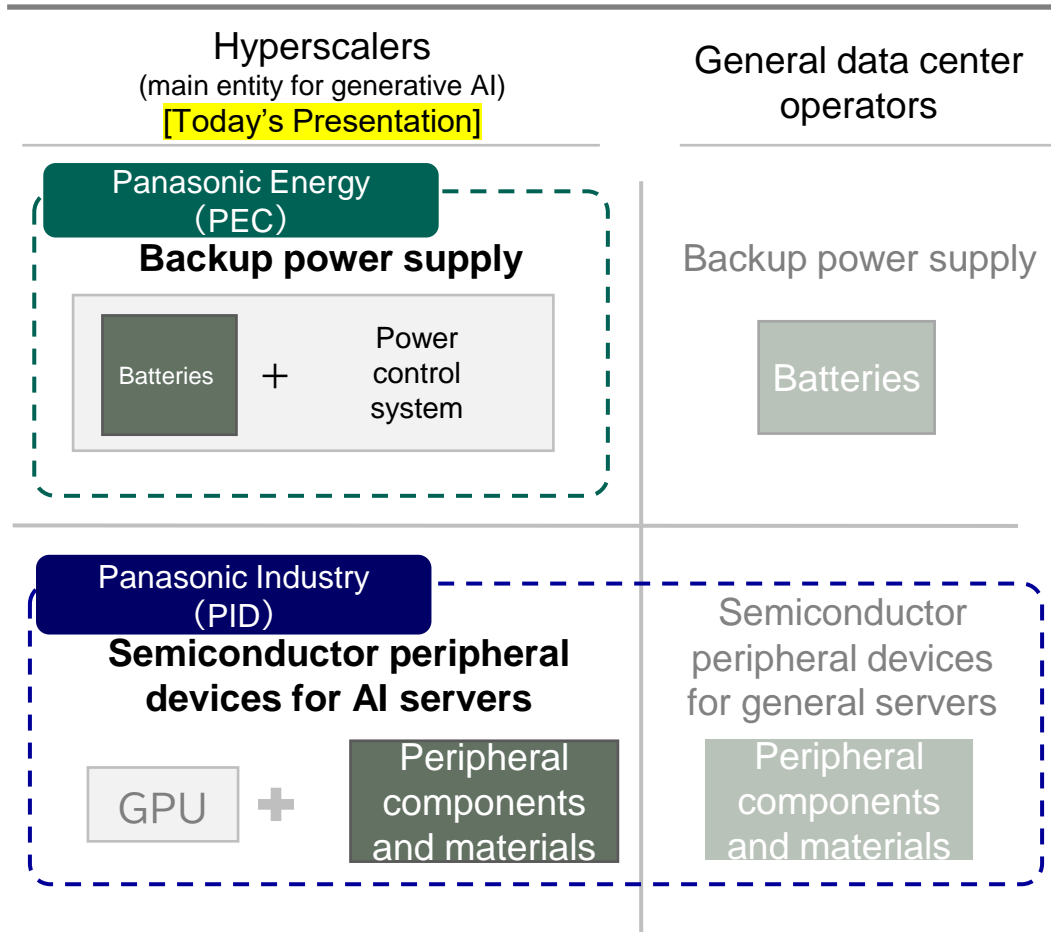
Various business opportunities in addressing challenges arising from the innovative evolution of data centers





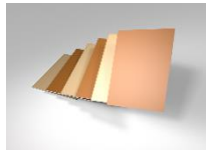
1-3. Panasonic Group's Contribution with Products & Services

Facing areas with high growth potential and strengths, maximizing value proposition at different layers

Business Areas



Target Customers and Key Products

Operating Company	Target Customers	Market Position	Products / Features
PEC	Hyperscalers	Tier1	<p>LIBs & Modules</p>  <p>High power & high durability + control</p>
PID	Semiconductor manufacturers ODMs Circuit board manufacturers	Tier2 Tier3	<p>Capacitors</p>  <p>Reduced height & large capacity</p> <p>Circuit board materials</p>  <p>High speed & low transmission loss</p>



Agenda

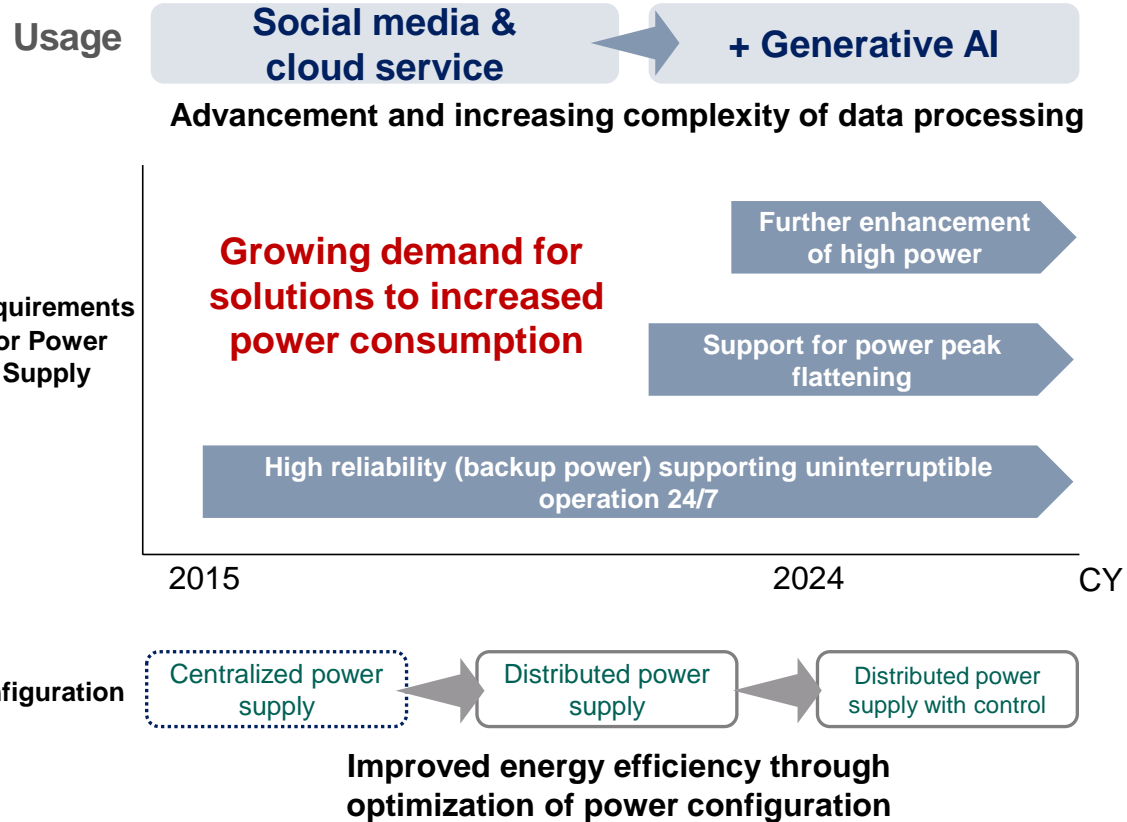
1. Market Environment and Business Opportunities for the Panasonic Group
2. **Panasonic Energy's Initiatives**

2-1. Market Environment for Data Center Storage Batteries

The rapid advancement of generative AI is driving an expansion in effective demand for Panasonic

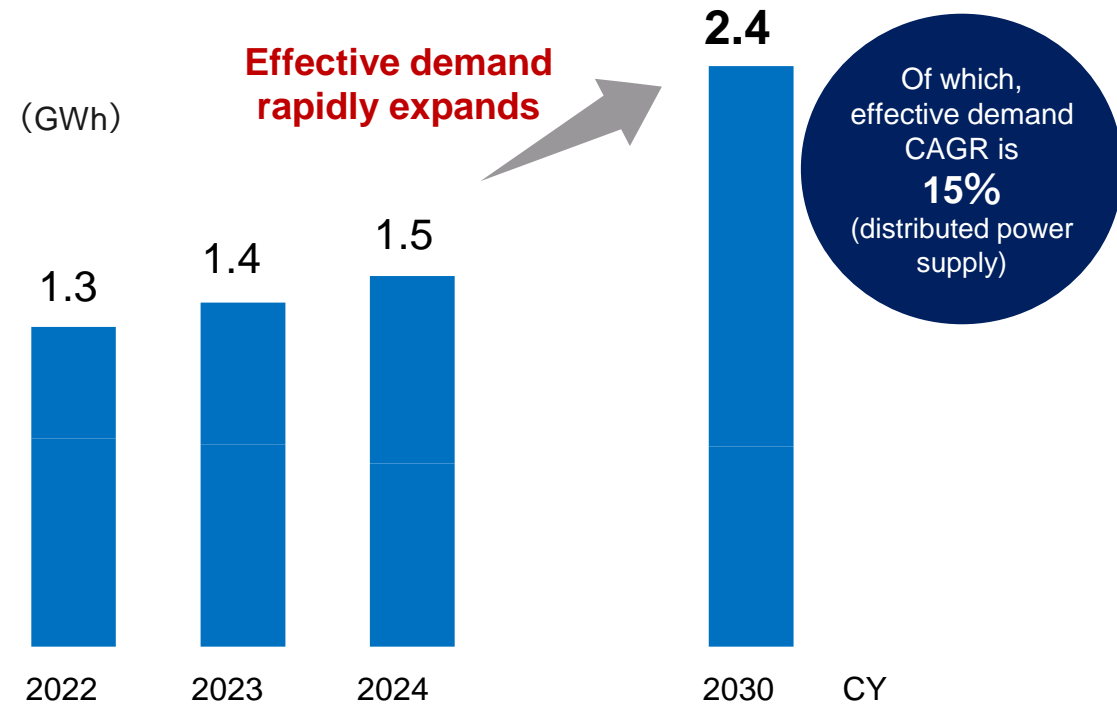
Customer Needs

Addressing increased power consumption due to advanced and complex data processing



Storage Battery Demand for Power Supply Systems

Distributed power supply for generative AI are driving high demand growth



Source: Estimated by PEC based on Synergy Research

Reference: Power and Backup Configuration of Data Centers

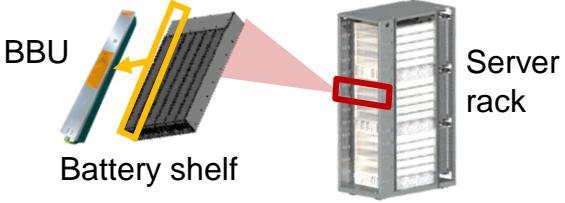
Limited space ← Installation space → Large space

For Data Center Server Backup

For Energy Management

Distributed Power Supply (BBU)

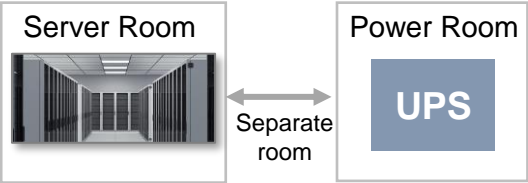
Power supply is distributed across each rack



BBU = Battery Backup Unit

Centralized Power Supply (UPS)


Power supply is centrally managed in a separate room



UPS = Uninterruptible Power System

Stationary ESS

Power supply can be in a separate area



ESS = Energy Storage System

Hyperscalers

PEC
High power and space efficiency are needed

General data center operators

Lead acid or LFP battery manufacturers
(LFP: Lithium iron phosphate)

Where space constraints are fewer, low-cost lead and LFP batteries are commonly used

2-2. Vision for Our Data Center Related Business

Aiming to be an integrated power solution provider with a system by leveraging advanced battery technology at its core.

Strategic Framework

Refining strengths to enhance solution value for customers

Strengths

- High-power and high-durability cylindrical cells
- Development capabilities of vertically integrated systems
- Long-term supply track record with industry-leading customers

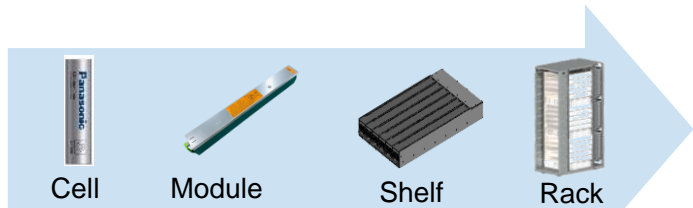
Top Share

Refine

Vision

Power Solution Provider

Maximizing value with power systems centered around safe batteries



Battery business

Power supply system business

Speed
Reliability
Cost

Differentiation

Initiatives

Strengthening supply capabilities in North America with proprietary cells and systems

Solution enhancement	<ul style="list-style-type: none"> • Early proposal of next-generation power systems based on customer partnerships • Developing dedicated cells for data centers (high power & high durability) • Supplementing technologies through alliance partnership
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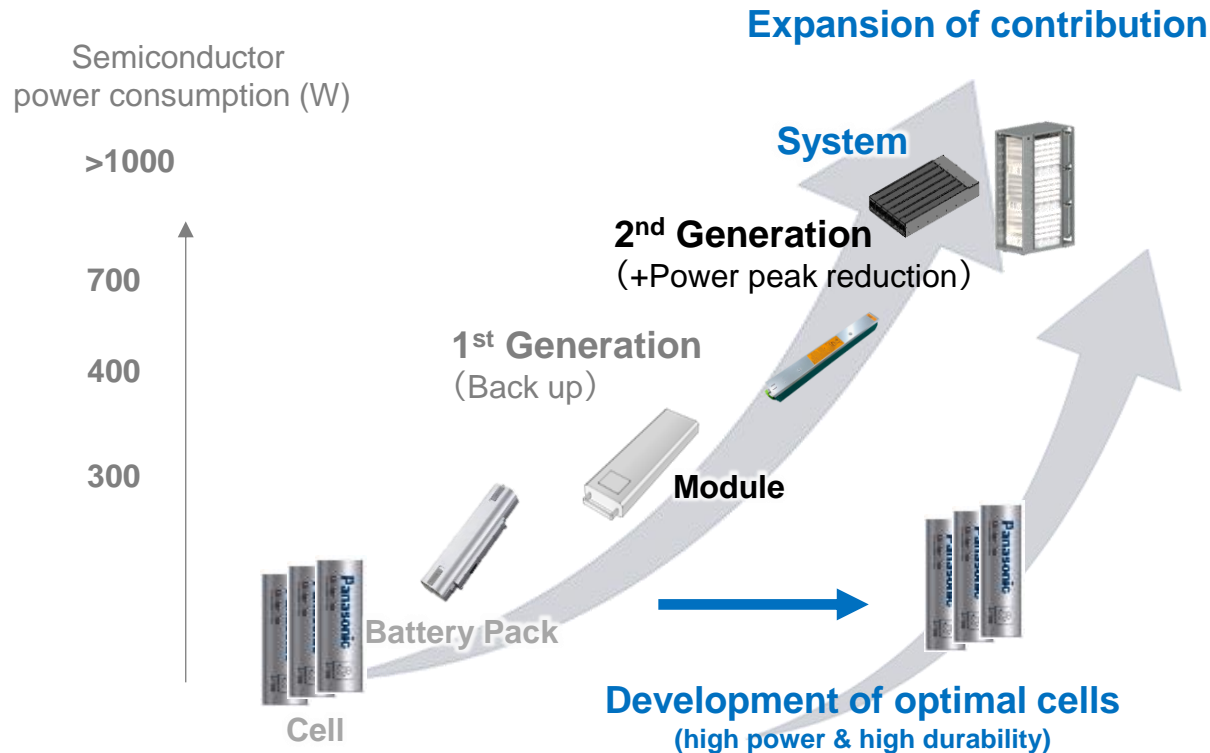
Establishment of supply capabilities	<ul style="list-style-type: none"> • Improving logistics, procurement, and capital efficiency through expanded production in North America
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2-3. Enhancing Efforts to Drive Business Growth

Seizing business opportunities by delivering unique value to customers in a timely manner

Solution Enhancement

Providing our unique value by developing power supply systems that meet high power, high durability, safety, and energy efficiency

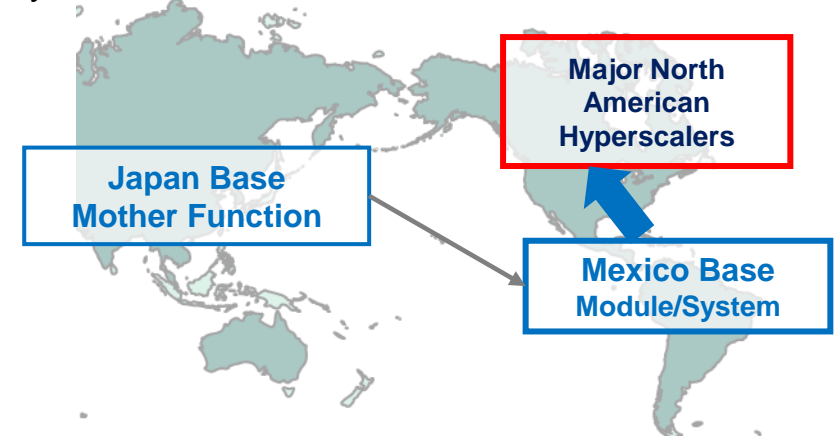


Enhancement of Supply Capabilities

Expanding production capacity promptly through efficient investment

Japan (Cell)	<ul style="list-style-type: none"> • Expanding lineup (φ18/21) • Establishing high-efficiency lines for small-batch, diverse products
Mexico (Module/System)	<ul style="list-style-type: none"> • Planning to strengthen the assembly lines • Increasing local procurement ratio

Strengthening production capabilities, with North America as the key market

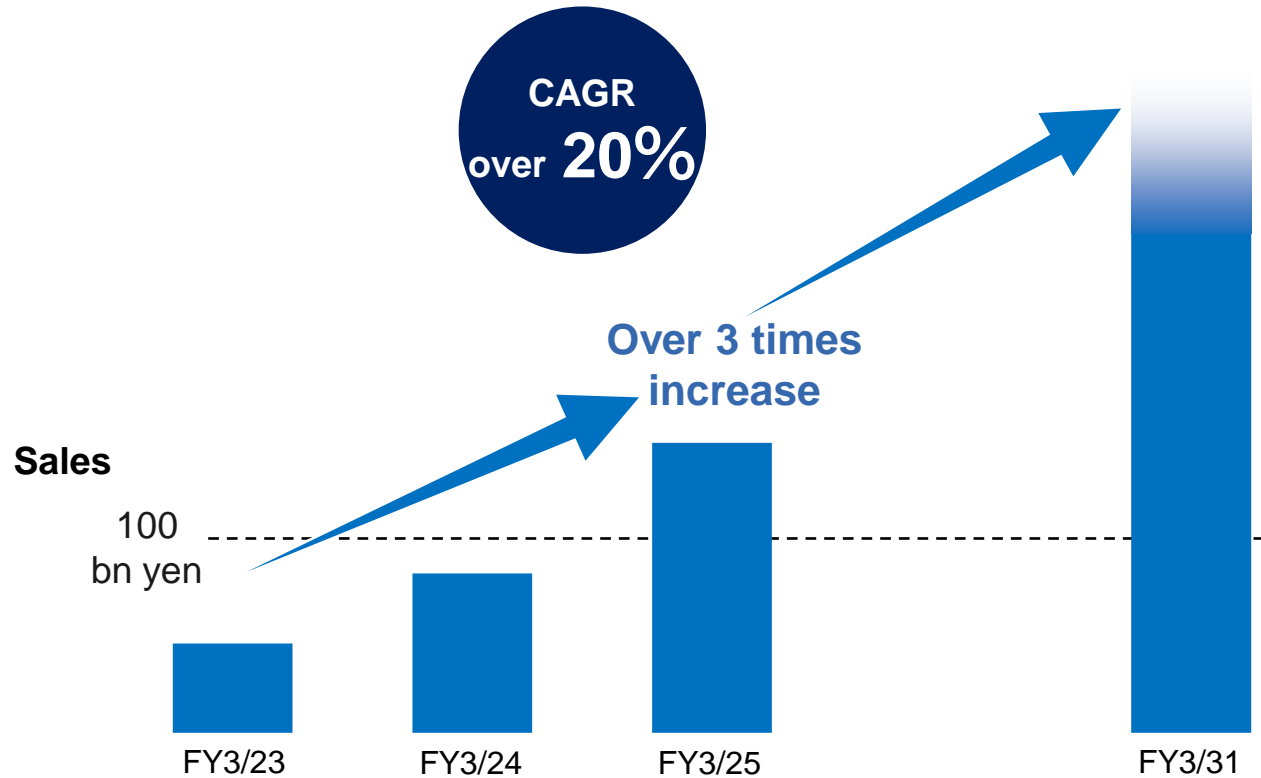


2-4. Business Target

Aiming for greater business growth and enhanced capital efficiency by increasing solution value

Sales (Energy Storage Systems for Data Centers)

Significant business growth through increased value with systemization



Panasonic ENERGY

Energy that changes the future.



Generative AI-Related Business Overview (Panasonic Industry)

November 27, 2024

Shinji Sakamoto

President & CEO

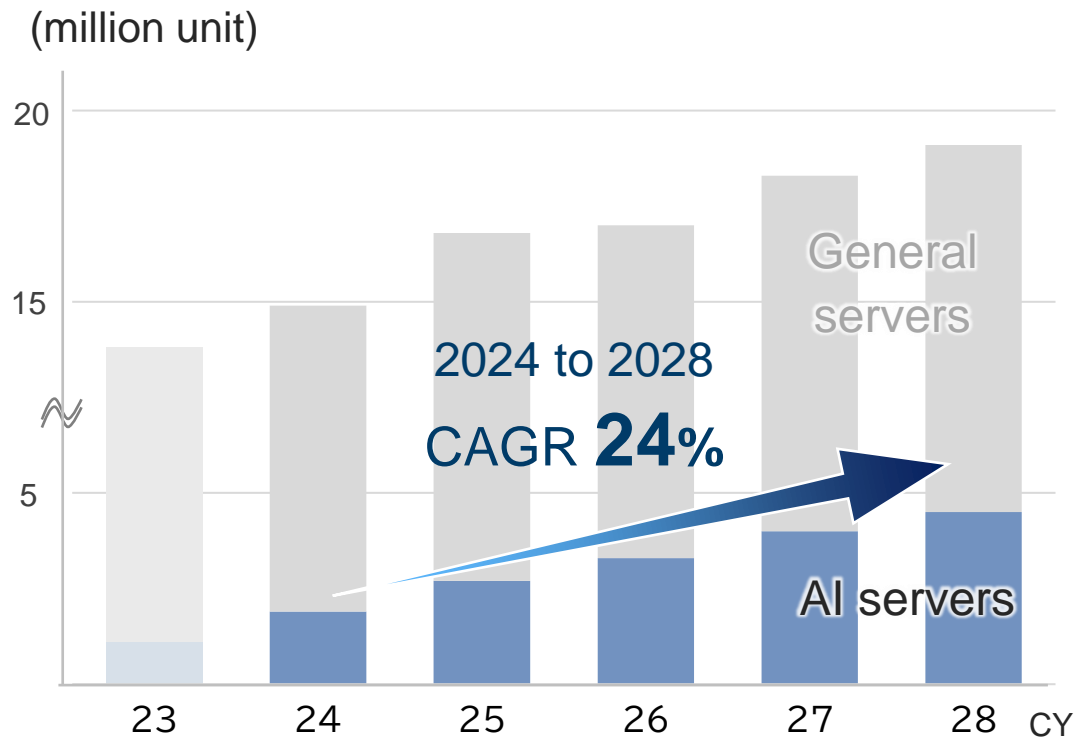
Panasonic Industry Co., Ltd.



Business Environment of Electronic Devices for AI Servers

With the spread and evolution of AI servers, **demand for electronic devices are expanding.**

Number of servers



Demand for capacitors

Compared to general servers (per unit) (as of 2024)

No. of capacitors installed

22x

Selling price

30x

or more

Expecting further increase in numbers, with the trend toward higher current to progress going forward

AI Server Technology Trends

As GPUs achieve higher-speeds using higher current, adaptation to **more challenging operating environment** is required.

High-temperature environment

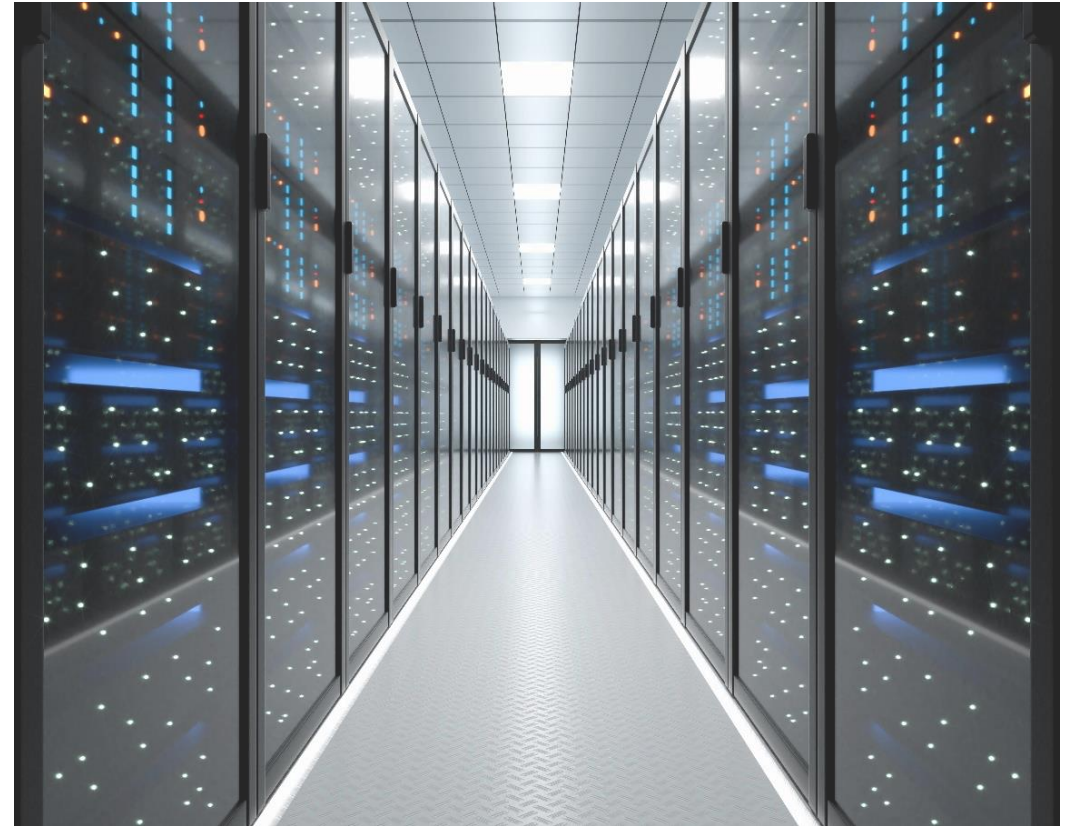
due to intense heat generation

Limited space

due to an increased number of parts

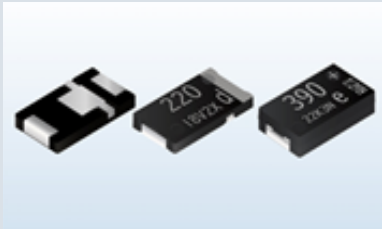
Larger impact of data transmission loss

due to high-speed processing



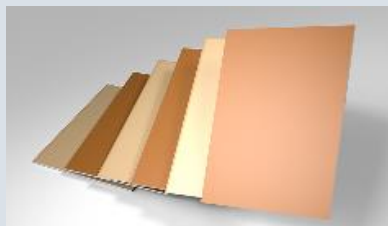
Our Strength

Overwhelming product competitiveness developed through automotive business (No. 1 share)



Compact, large-capacity, high-heat resistance

Conductive polymer capacitors (e.g. SP-Cap, POSCAP)



Lowest transmission loss in the industry

High-performance multilayer circuit board materials (MEGTRON)

Ability to capture industry trends accurately (strong customer bases)



Wide range of customer touchpoints covering the entire ecosystem of the industry



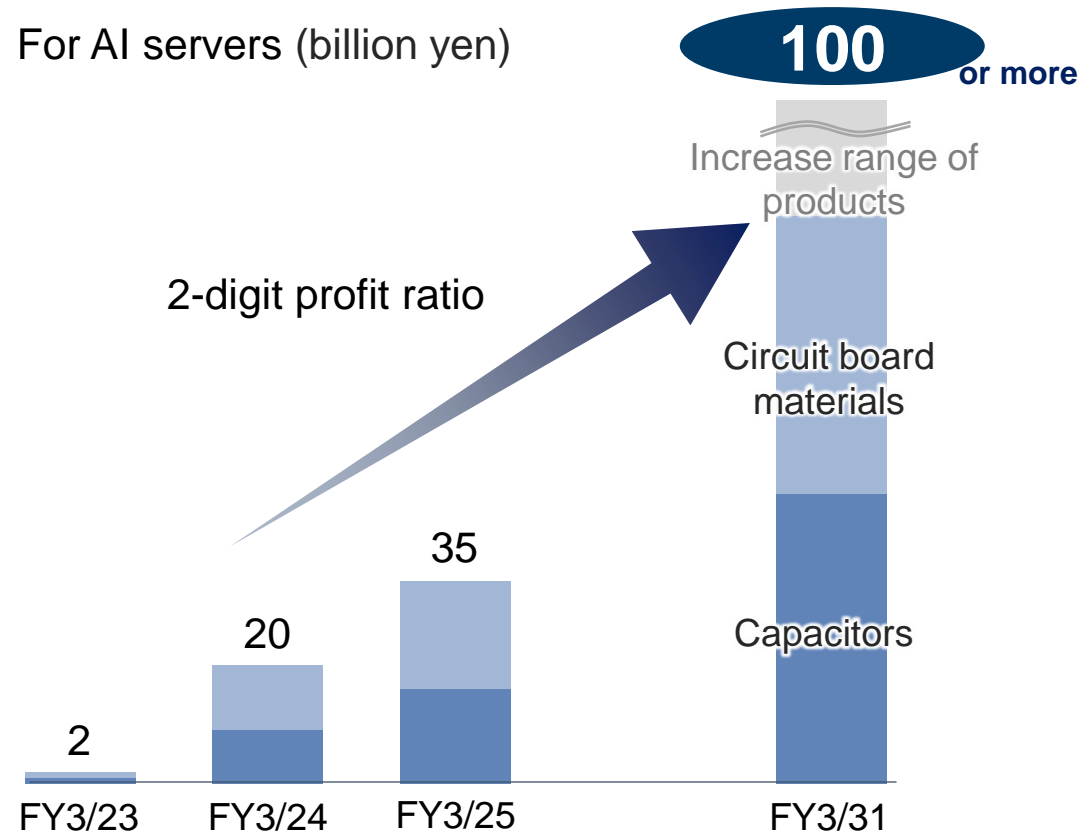
Long-standing relationships with high degrees of trust with **key players in the industry** (semiconductor manufacturers and ODMs)

Future Business Prospects

Enhance technological capabilities and product development
as **a new pillar of business**

Sales

For AI servers (billion yen)



Initiatives for growth

Strengthen development of core technologies

- Development of next-generation capacitors and circuit board materials
- Achieve 25 times development efficiency via Smart Lab automated experiments

Product development anticipating customer needs

- Expansion of product lineup to respond to the evolution of AI (e.g. capacitors that stabilize power supply)

Expansion of supply capacity

Panasonic
INDUSTRY

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