GS YUASA
Creating the Future of Energy

Industrial Battery and Power Supply Business Briefing

Monday, March 17, 2025

GS Yuasa Corporation

GS Yuasa International Ltd.
Industrial Battery and Power Supply Business Unit

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1 Outline of Industrial Battery and Power Supply Business [Business Trajectory]

GS 日本電池

Inventor's spirit
contribute to society by developing high quality products

Founder of Japan Storage Batteries Co., Ltd.
Genzo Shimadzu

1917:
Establishment of Japan Storage Battery Co., Ltd.

Large-scale backup power supply for the Kyoto Kawaramachi Plant (Source: Shimadzu Corporation)

Tokyu Motosumiyoshi Substation (Source: Kawasaki City)

1937: Establishment of Nippon Yusoki Co., Ltd. and expansion of electric vehicles

1993:
Development of prismatic lithium-ion batteries

2000s:
Contributing to spread clean energy
Launch of a series of storage systems for renewable energies

2004
Corporate Merger
GS YUASA

2006:
GS Yuasa Lithium Power Inc., the first overseas lithium-ion battery site established

GS YUASA
SANKEN

2021:
Acquired the infrastructure business from Sanken Electric Co.,Ltd
Strengthening competitiveness by combining technical and development capabilities and creating synergies in the infrastructure field

1920s: Contributing to a stable supply of electric power
Growing demand as backup power supplies of buildings and public infrastructure

1930s: Development of mercury rectifier
Growing importance as an emergency power supplies during disasters

1970s: Development of sealed lead-acid batteries
Mass production of maintenance-free batteries

1918:
Establishment of Yuasa Storage Battery Co., Ltd

Challenging spirit
develop new businesses ahead of time

Founder of Yuasa Storage Battery Co., Ltd.
Shichizaemon Yuasa

YUASA

Large-scale backup power supplies for Keihan Electric Railway

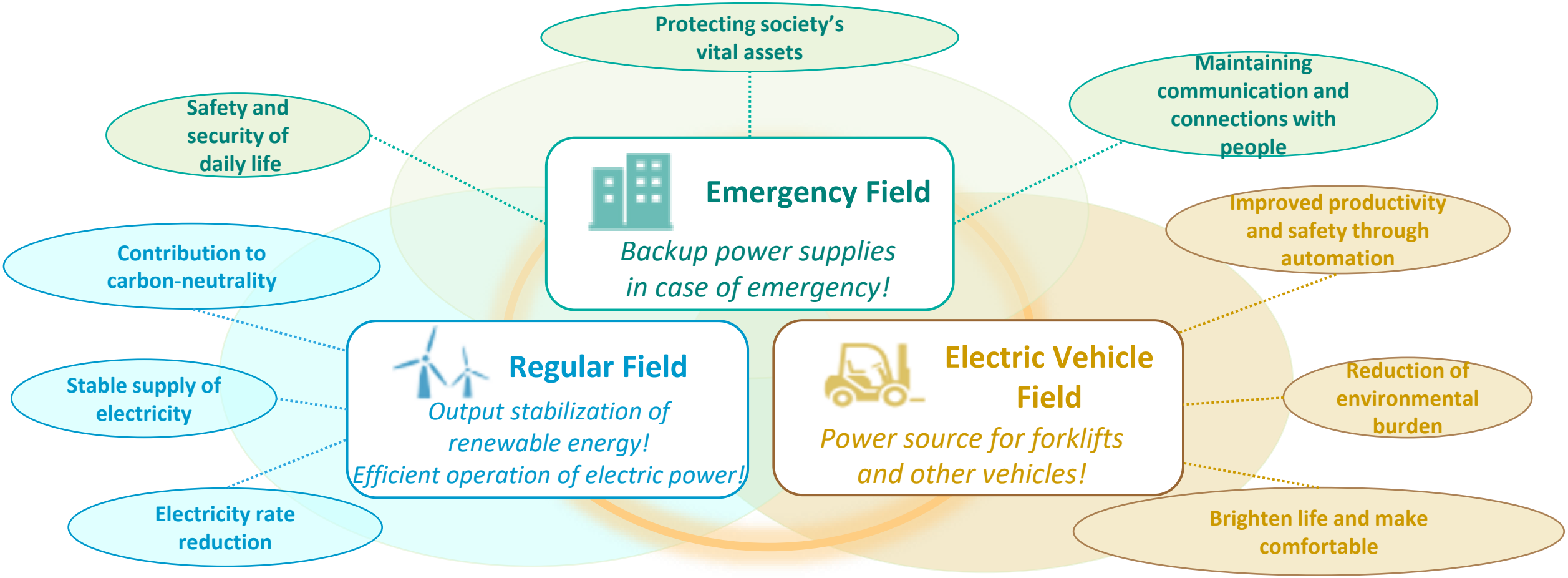
1960s-:
Establishment of overseas sites
1963 Yuasa Battery (Thailand) Pub. Co., Ltd.
1966 Siam GS Battery Co., Ltd.
1977 GS Battery (U.S.A.) Inc.
1981 Yuasa Battery (UK) Ltd.
1988 Century Yuasa Batteries Pty Ltd.

2010s:
Installed lithium-ion batteries for port AGVs (Automated Guided Vehicles)
Contributing to an energy-saving society

2018:
Received the order of a world-class storage battery facility
Acquired order for a world-class storage battery facility of approximately 720MWh to be installed in Toyotomi Town, Hokkaido

1 Outline of Industrial Battery and Power Supply Business [Business Overview]

We are engaged in the development, production, sales, and servicing of lead-acid batteries, lithium-ion batteries, and power supplies used in the industrial use.
We continue to provide various values to people, society, and the global environment through our business in the fields of emergency use, regular use, and electric vehicles field.



1 Outline of Industrial Battery and Power Supply Business [Products Handled]

Emergency Field

Industrial lead-acid batteries

- Small size valve-regulated lead-acid batteries
- Vented stationary lead-acid batteries
- Valve-regulated stationary lead-acid batteries

DC power supplies

- For general use
- For telecommunication
- For telecommunication (General-purpose type)

Charging and discharging machines for electric vehicles

EVOX System

AC uninterruptible power supplies (UPS)

- Semi-universal type
- Individual order type
- Parallel processing method
- For outdoor use

General-purpose UPS

- Lithium equipped type
- Deferral type
- Rack mount type
- Management software

Power storage systems for railway

E^3 Solution System

Regular Field

Industrial lithium-ion batteries

- High power type
- High energy type
- Dedicated modules for DC48V

ESS*

*Energy Storage Systems

PCS

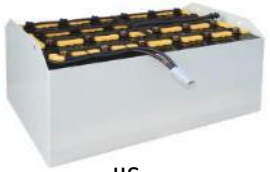
- Power conditioner
- Power storage systems

Remote monitoring and warranty service
Storage batteries monitoring equipment

- STARELINK Service
- DATAWINDOW-S

Electric Vehicle Field

Lead-acid batteries for electric vehicles



JIS

DIN

Lead-acid batteries for small electric vehicles

Liquid-type

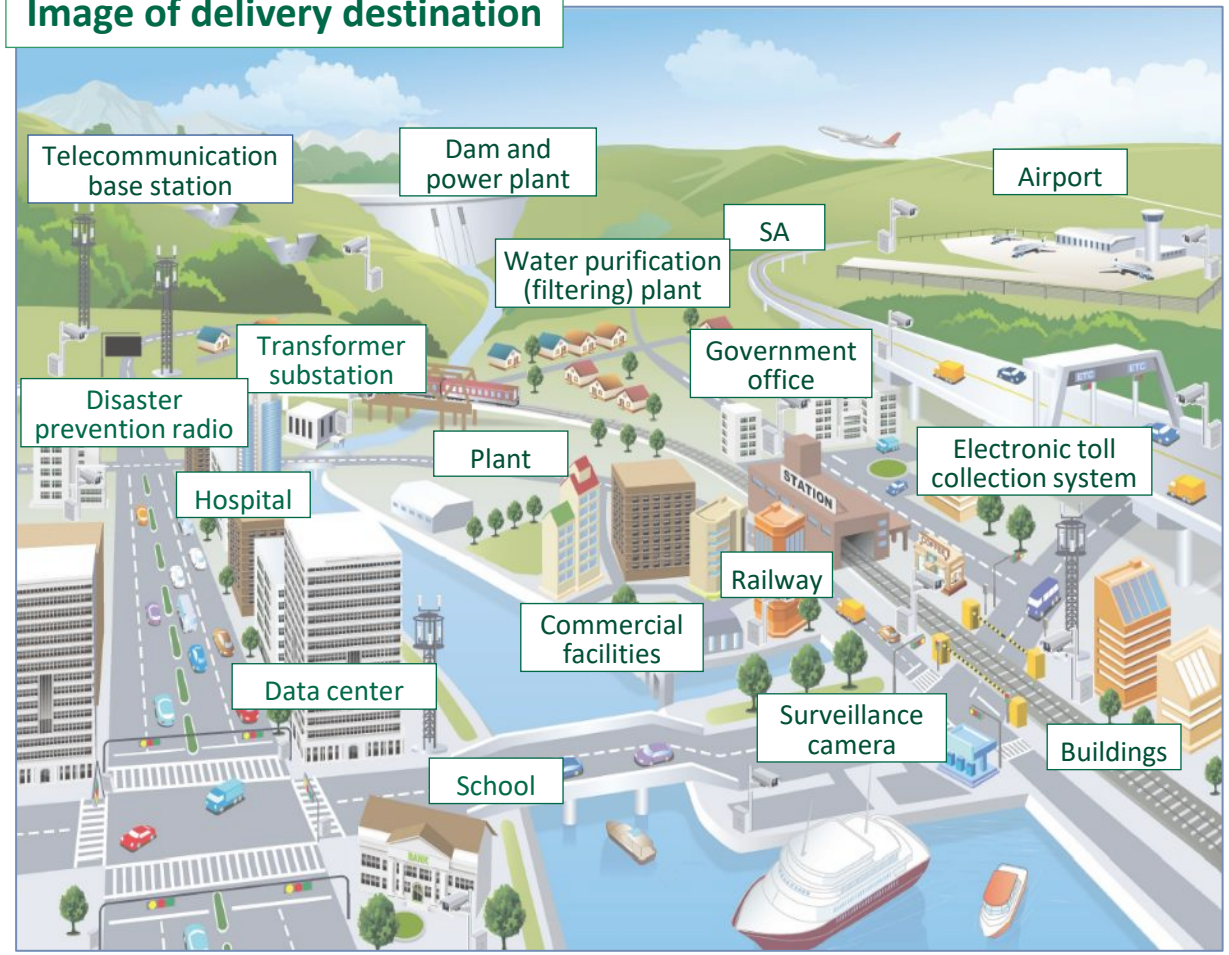
Valve regulated type

Charger for electric vehicles (Lead-acid batteries)

1 Outline of Industrial Battery and Power Supply Business [Product Applications: Emergency Use (Backup Use)]

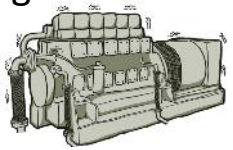
We contribute to the "safety and security" in Japan by providing storage battery facilities to a wide range of public infrastructures throughout Japan.

Image of delivery destination



Storage batteries facilities are essential for critical facilities and equipment

Example of the role of storage batteries in the event of a power outage

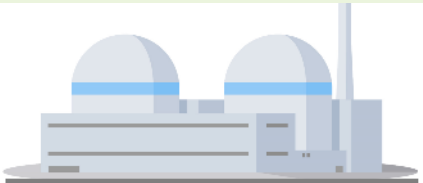


Provide electric power for emergency lighting
(Illuminate evacuation corridors)

Starting the power generator
(Connects to power in case of emergency)

Data center

Telecommunication base station



Nuclear power plant

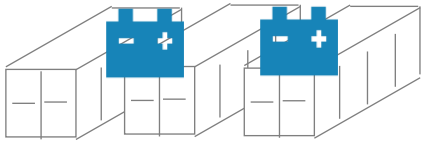
Keep precision equipment and critical facilities running
(Uninterruptible switching power supply, long-time power supply in case of disaster, power supply until safe shutdown)

1 Outline of Industrial Battery and Power Supply Business

[Product Applications: Regular Use (Require Constant Charging and Discharging)]

We supply ESS as measures to make effective use of rapidly expanding renewable energies and electricity, and contribute to propose carbon neutrality in Japan

For the grid



Electricity market transactions

Electricity supply and demand adjustment, earning revenue from electricity sales

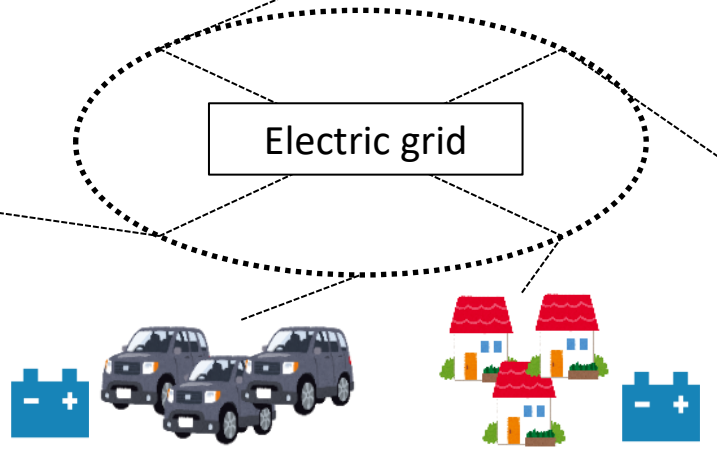
Maintenance and expand of electricity market

Wholesale power market	2005-
Supply-demand adjustment market	2021 - Under preparation
Capacity market	2020 (Operation will start from 2024)

For renewable energy co-location

Frequency fluctuation suppression

Adjusting the supply and demand of electricity by charging surplus electricity and discharging when there is a power shortage



For demand co-location

Peak Cut / Peak Shift Demand response

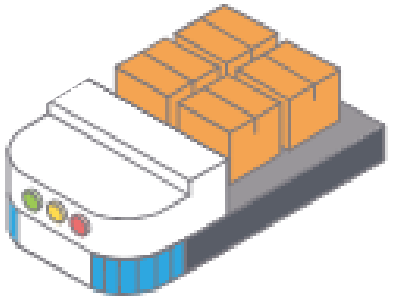
Reduce electricity costs and earning revenue

1 Outline of Industrial Battery and Power Supply Business [Product Applications: Electric Vehicle Field (Moving Application)]

Contributing to reduction of environmental burden and CO_2 emissions through electrification by providing storage batteries for various types of moving application

Forklifts

AGV (Automated Guided Vehicle)



Golf carts

Aerial work platform vehicle

Mobility scooter

Sweeper

Amusement vehicle

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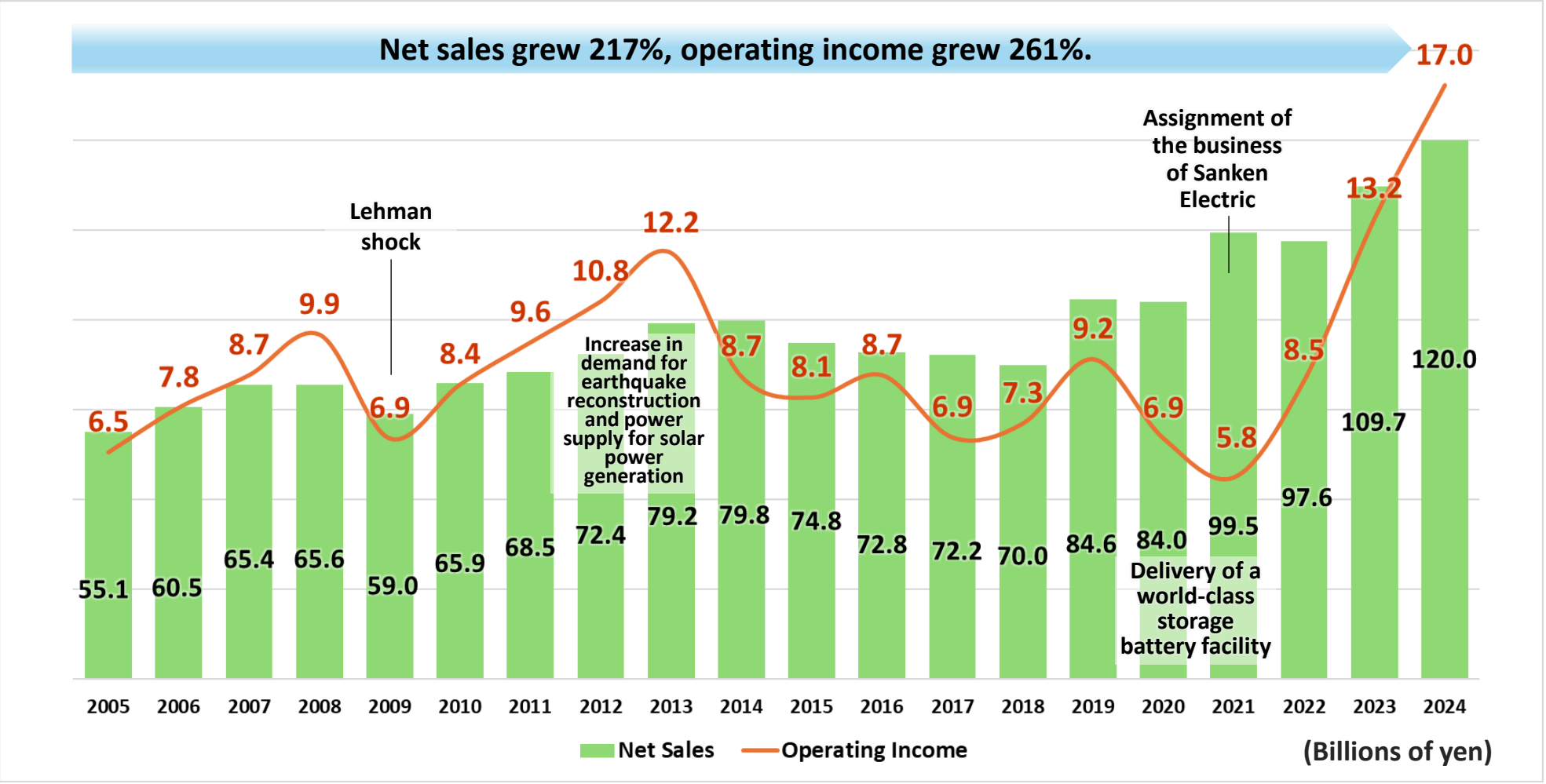
2 Market Trends [Business Performance Trends of Industrial Battery and Power Supply Segment]

Corporate Merger

- First Mid-Term Management Plan (FY2006-2008)
- Second Mid-Term Management Plan (FY2010-2012)
- Third Mid-Term Management Plan (FY2013-2015)
- Fourth Mid-Term Management Plan (FY2016-2018)
- Fifth Mid-Term Management Plan (FY2019-2022)
- Sixth Mid-Term Management Plan (FY2023-2025)



2 Market Trends [Trends by Segment]

* GS Yuasa's own research

Emergency Field

Sales Share

[Domestic emergency use] [Overseas emergency use]

Market Growth

Flat

Flat

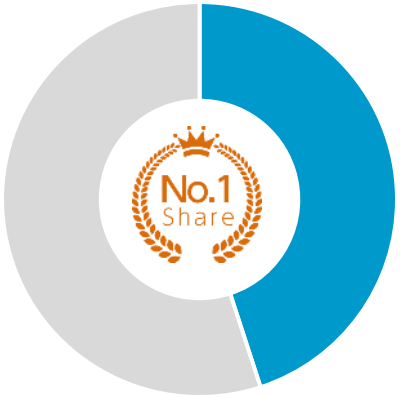
Business Growth

Slight increase

Growth

Regular Field

[Domestic regular use]



Big growth

Big growth

Electric Vehicle Field

[Domestic electric vehicles] [Overseas electric vehicles]

Flat

Flat

Flat

Growth

Contents

3 Medium- to Long-term Strategy

■ Market Trends

Carbon-neutrality

Severe disasters and disaster prevention

IoT, DX, AI

Energy mix

Economic security

■ Our Strengths

- ✓ Long-term operation experience in the market, overwhelming market share and number of units delivered
- ✓ A large number of top customers in a wide range of fields, and a nationwide network of distributors
- ✓ Highly reliable products (In lead-acid batteries, we have more than 100 years of market experience. In lithium-ion batteries used in industrial applications, we have more than 20 years of market experience.)
- ✓ A wide product lineup and custom engineering capabilities to meet customer needs
- ✓ Maintenance through a nationwide field service network and the ability to respond quickly to emergencies (More than approximately 1,000 engineering personnel nationwide)

■ Direction of Key Businesses

Domestic emergency use

While there is an increase in demand due to disaster prevention measures and the deepening of the IoT society, the market size remains flat, partly due to a decrease in public infrastructure resulting from population decline and a decrease in demand resulting from power saving in electrical equipment. Our strengths lead to superiority, and we have the No. 1 market share.

▼

Improve business efficiency while maintaining business scale by maintaining our overwhelming superiority in the market

Domestic regular use

Market size will grow significantly due to the promotion of carbon neutrality by the government. We have an overwhelming advantage as a domestic battery manufacturer. On the other hand, compared to overseas manufacturers as competitors, we are inferior in terms of scale and cost.

▼

Grow into a second business pillar as an industrial use due to the development of a mass production system and further cost reductions in addition to improving product performance

3 Medium- to Long-term Strategy, Domestic Emergency Use

Needs of storage battery facilities for severe disasters and disaster prevention response

- Increased risk of Nankai Trough earthquake
- Building national resilience policy
- Addressing aging public infrastructure
- Increase in critical equipment to be protected

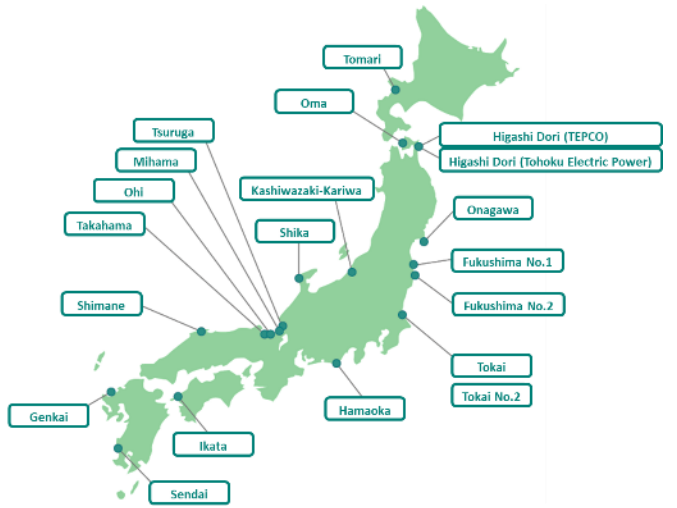
Demand for new installation and renewal of storage battery facilities remains high throughout Japan

- ✓ **Capture new demand through collaboration with nationwide network of sales agents, their business partners, and major intermediary customers in Japan**
- ✓ **Acquire renewal demand by performing maintenance through a nationwide service site network in Japan and proposing renewal of existing facilities in the nationwide sales network**

Needs for storage battery facilities as part of the energy mix and economic security

For nuclear power generation

- Highly secure and reliable special storage battery facilities are required
- For use of key infrastructure, domestic products are desired



Restarted	Permission	Pending	Not applied	Decommissioned
14	3	10	9	24

*From the website of the Nuclear Regulation Authority and the Federation of Electric Power Companies of Japan

- ✓ **Acquire demand with our technical and customization capabilities cultivated over the past years**
- ✓ **Provide safety through maintenance by a nationwide network of service sites in Japan**

3 Medium- to Long-term Strategy, Domestic Emergency Use

Needs of storage battery facilities for next-generation public infrastructure

Next-generation telecommunications

- Equipment for “5G” and “6G”
- New base station equipment, etc.

Next generation transportation

- Equipment for "next generation high speed railway"
- Equipment for "self-driving cars", etc.

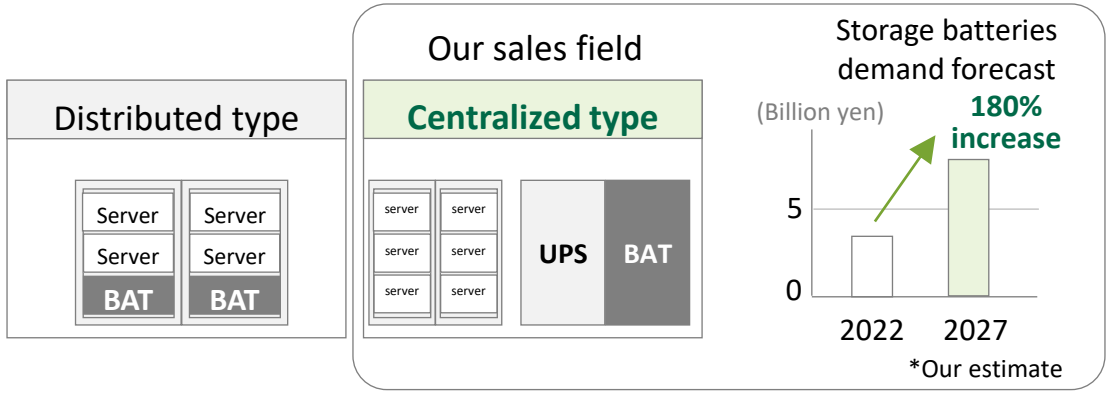
The **new** demand of storage battery facilities to protect critical infrastructure will be created as new critical infrastructure is developed through technological innovation

✓ **Developing and providing products that meet the needs required due to our past performance, technical capabilities, and good relationships with our customers**

Needs of storage battery facilities in the wake of IoT deepening, DX and AI expansion

IoT deepening, DX & AI expansion ▶ Increasing telecommunication volume, cloud migration ▶ Increasing demand of data center

Increased demand for UPS storage batteries for servers



✓ **In some cases, foreign DC operators use inexpensive foreign lead-acid batteries, but in many cases, they place importance on cost and quality, and we can acquire demand with high-quality domestic lead-acid batteries**

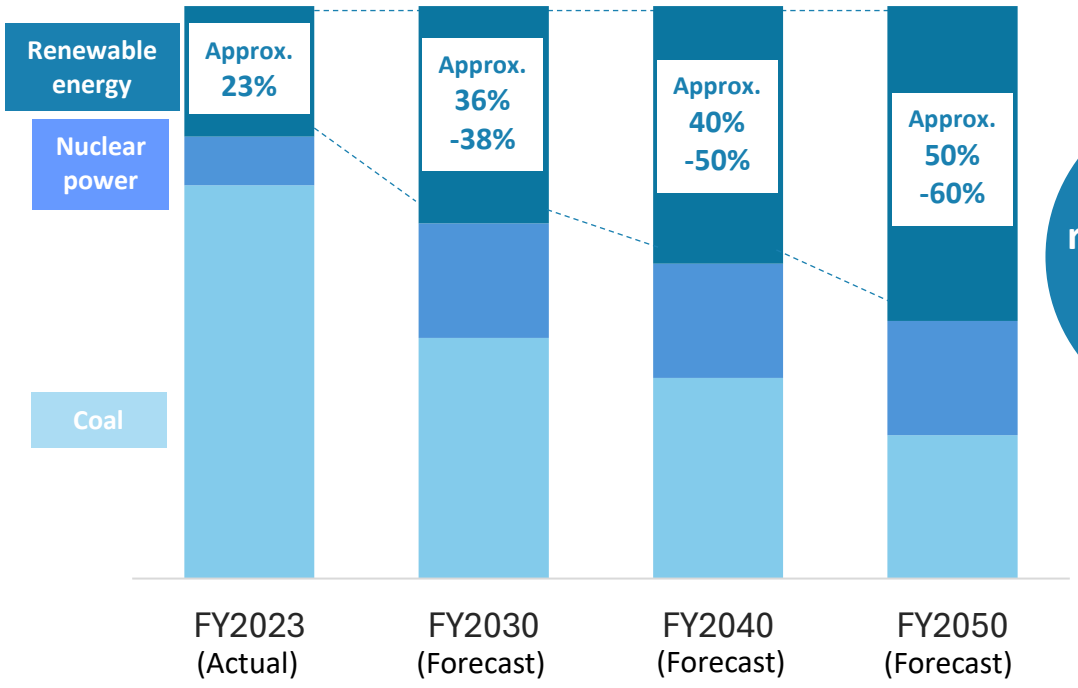
✓ **We have a lineup of lower-cost lead-acid batteries to meet a wider range of needs**

3 Medium- to Long-term Strategy, Domestic Regular Use

Storage batteries needs to achieve carbon neutrality by 2050

- ✓ Since electricity demand and the amount of renewable energy generation fluctuate, the ability to adjust the supply-demand balance is necessary
- ✓ Lithium-ion storage batteries account for the majority of use for the grid, for renewable energy co-location, and for demand side because of their effectiveness in addressing short- and medium-period supply and demand fluctuations
- ✓ The market for storage batteries for the grid will rapidly expand due to the expand of maintenance of electricity market

The Seventh Basic Energy Plan



Assumes renewable energy exceeds 50% in 2050

Electricity market

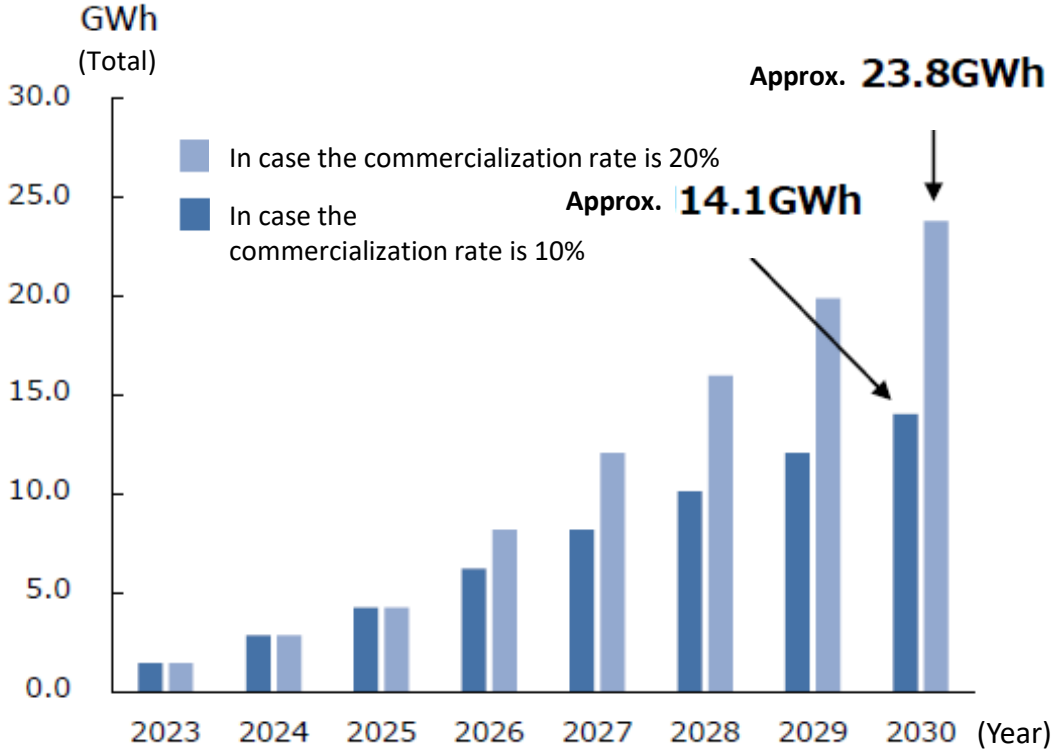
Value of power supplies, etc.	Value traded (Products)	Markets traded
Electricity usage [kWh value]	Electricity actually generated → Monetize the root difference by charging when electricity rate is cheap and discharging when it is expensive.	Wholesale power market
Capacity (Supply capacity) [kW Value]	Ability to generate electricity → Receive payment by installing storage batteries for when supply and demand are tight and maintaining capacity.	Capacity market
Adjustment amount [⊿kW value]	Ability to adjust supply and demand in a short period of time → Receive compensation by discharging electricity from batteries when there is a power shortage to adjust the supply-demand balance.	Supply-demand adjustment market

3 Medium- to Long-term Strategy, Domestic Regular Use

Government support for storage batteries is accelerating

- ✓ **Expand domestic manufacturing base to 150 GWh**
- ✓ **Domestic market creation and promoting introduction of storage batteries through subsidies for the introduction of stationary storage batteries, etc.**

[Outlook for the introduction of storage batteries for the grid]



Government support measures (as of FY2024)

*All support measures are for business operators, not for manufacturers.

Use (Purpose)	Name	Date	Support amounts, etc.
Energy storage business (Electricity market transactions)	Grid-connected storage battery subsidy	Until 2027	¥40.0 billion 1.3GWh
	Long-Term Decarbonization Power Source Auctions	Plan to be continued (Period not yet determined)	¥80.0 billion 4GWh
	Tokyo Metropolitan Government grid-connected storage battery subsidy	Until 2030	¥13.0 billion 0.6GWh
Renewable energy co-generation (FIP transfer / Frequency adjustment)	Support for storage batteries with renewable energy power supplies	Plan to be continued (Period not yet determined)	¥16.0 billion 0.5GWh
Demand customer installation (Electricity cost reduction, BCP)	DR-compatible storage batteries (for business and industry)	Plan to be continued (Period not yet determined)	¥1.5 billion 0.1GWh

Examples of delivery

ENEOS Chiba Refinery

Output: 100MW / Capacity: 202MWh

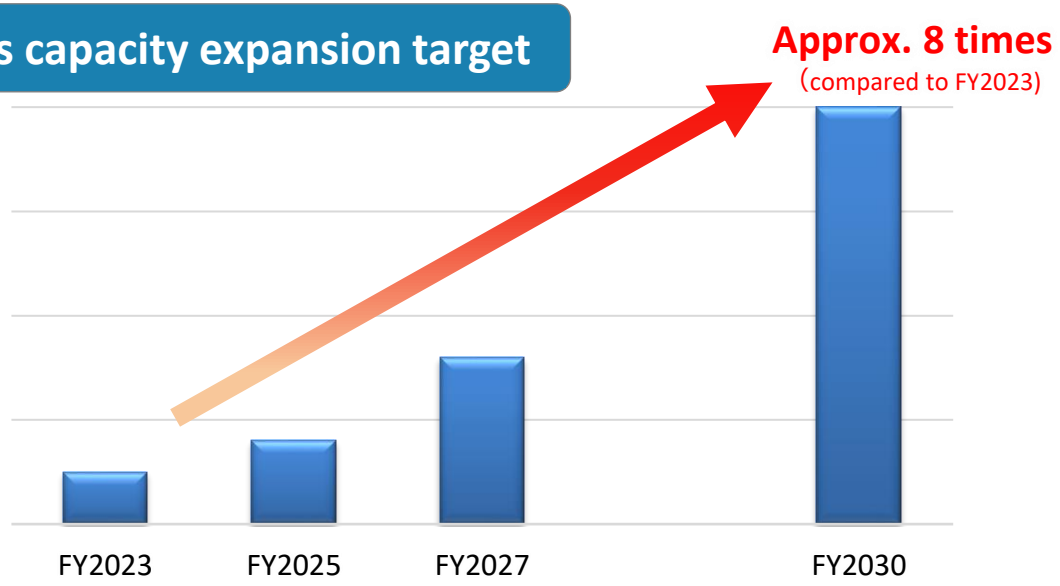
NTT Anode Energy Tagawa Power Storage Station

Output: 1.4MW / Capacity: 4.2MWh

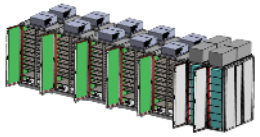
Source: Materials distributed at the 3rd Expert Working Group Meeting for the Realization of GX Cabinet Secretariat (November 8th, 2023)

3 Medium- to Long-term Strategy, Domestic Regular Use

Sales capacity expansion target



ESS with containers
Storage batteries
＋
STARELINK Service*



All in One Business
Storage batteries
＋
STARELINK Service*
＋
PCS

Next-generation ESS

Further strengthen competitiveness

*The service of “Remote monitoring” “Analysis and diagnosis” “Maintenance and preservation” and “Long-term guarantee” we provide.

GS Yuasa’s Advantage

- ✓ Has a **long operating track record** in the market (Operation has started since 1999)
- ✓ **In-house production** from storage batteries cells to systems **in Japan** to contribute to storage battery industry in Japan
- ✓ Achieved high safety by our unique and excellent anti-fire structure **No fires or smoke accidents** in the market
- ✓ Remote and constant monitoring of all cell voltages and temperatures of all modules
  Using our unique degradation estimation technology, which is based on our many years of experience with cell degradation behavior, we can **guarantee long-term stable operation** of the system for 15 to 20 years
- ✓ **Nationwide service sites** are available, and in the event of a storage battery facility malfunction, a quick response is possible through coordination with the STARELINK Service* center.
- ✓ Acquired certification in 2008, when the wide-area certification processing system was launched
  Long-term contribution to industrial waste recycling in Japan

Issues

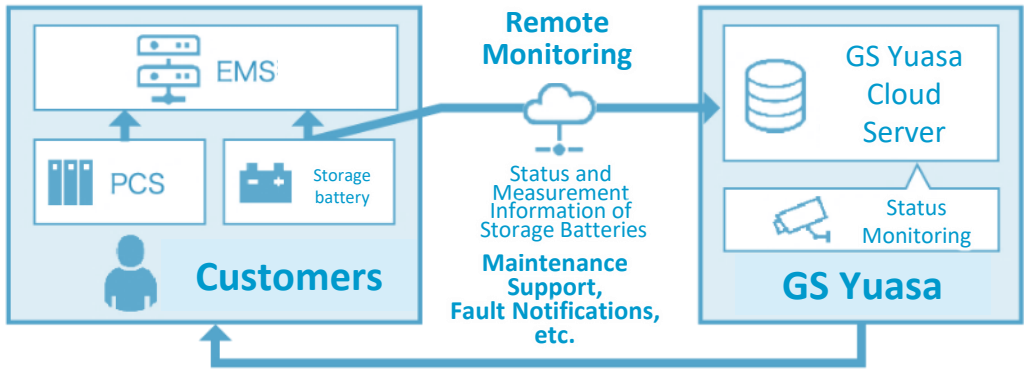
- ✓ Massive influx of low-priced foreign products and intensifying price competition
- ✓ Increased economic security risks
  (Unstable supply of overseas raw materials, ESS remote operation in electric power infrastructure, etc.)

3 Medium- to Long-term Strategy, Domestic Regular Use

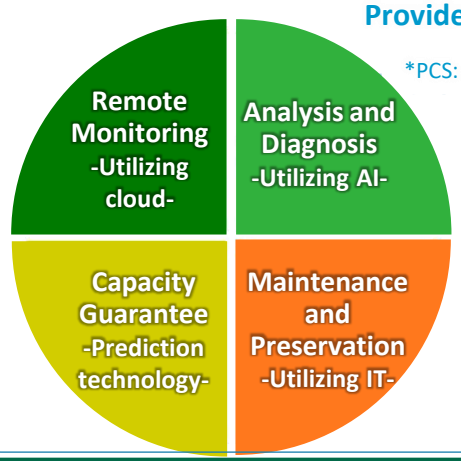
STARELINK Service

✓ **By combining our unique remote monitoring technology with predictive and prescient technologies and big data, we provide all-round monitoring of our customers' energy storage systems and storage battery facilities, and provide a wide range of services to ensure the safe, secure and stable operation**

Service image

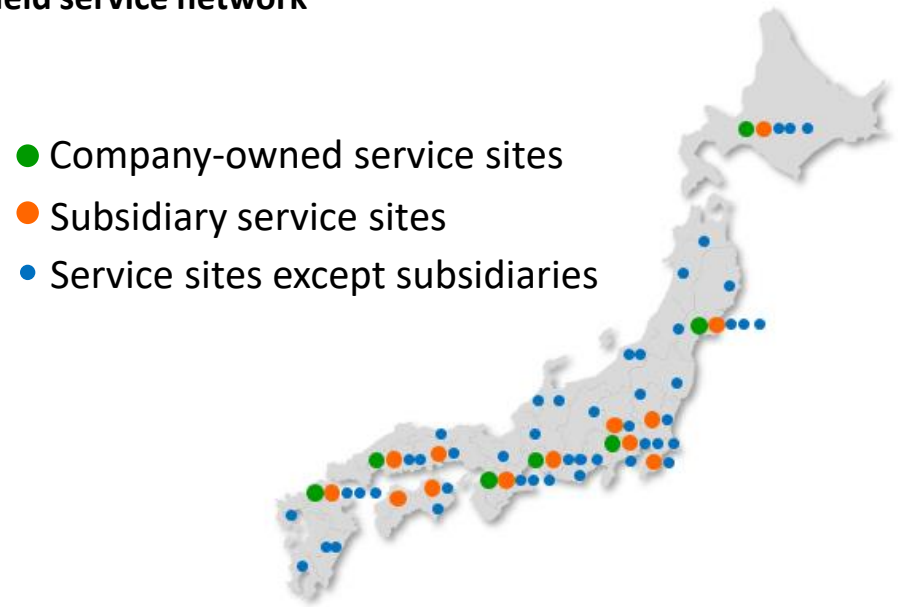


*PCS: Power conditioners, EMS: Energy Management System



Patent No. 6822624 / Patent No. 7207439

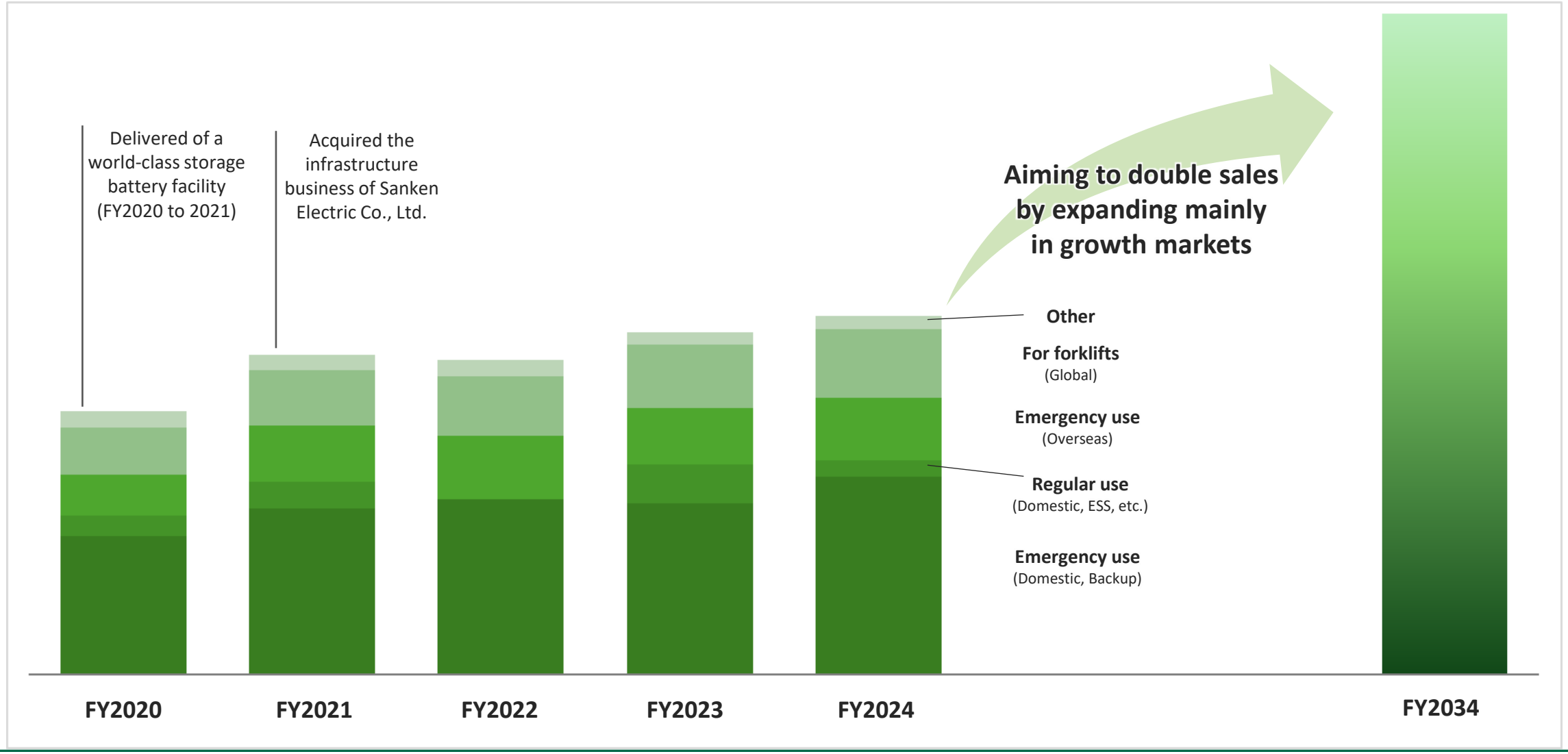
Field service network



We have nationwide service sites, and in the event of malfunction in storage battery facilities, a quick response is possible in cooperation with the STARELINK Service Center.

Service sites : More than 100 sites nationwide

3 Medium- to Long-term Strategy, Management Target after 10 years



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Creating the Future of Energy