

Business Overview and Market Environment

Business segment	Main applications	Main customers	Characteristics of the business
Automotive Batteries (Japan)	Automobiles For starting: Internal combustion engines (ICE) / Vehicles with start-stop systems (ISS: idling stop systems) For auxiliary equipment: Hybrid electric vehicles (HEVs) / Plug-in hybrid electric vehicles (PHEVs) / Electric vehicles (EVs)	For new automobiles: Japanese automakers For replacement: Distributors (electrical device shops, etc.) / Automobile accessory mass retailers / Automobile dealers / Oil refiners and sellers, etc.	<ul style="list-style-type: none"> Consistent revenue can be secured through replacement batteries High profit margin for lead-acid batteries for ISS vehicles Earnings affected by fluctuations in lead prices The demand period for replacements is winter The volume ratio of batteries for new automobiles to replacement is approximately 1:1 (the ratio varies from year to year)
	Motorcycles For starting:	For new automobiles: Japanese motorcycle makers For replacement: Distributors, etc.	
Automotive Batteries (Overseas)	Automobiles For starting: ICE / ISS vehicles For auxiliary equipment: HEVs / PHEVs / EVs	For new automobiles: Japanese automakers, etc. For replacement: Distributors, etc. (varies by country)	<ul style="list-style-type: none"> Earnings affected by fluctuations in lead prices As the foundation is local production for local consumption, the impact on foreign exchange earnings will be minimal Industrial lead-acid batteries are also included (Backup batteries in Europe account for the majority) The sales ratio from batteries for automobiles, motorcycles, and industrial applications is approximately 6:2:2 (the ratio varies from year to year) The Company's market share and profitability in Southeast Asia are high Replacement batteries account for a large portion of sales in Europe and Australia
	Motorcycles For starting:	For new automobiles: Japanese motorcycle makers For replacement: Distributors, etc.	
Industrial Batteries and Power Supplies	Emergency backup (Emergency use field)	Railways / Electric power / Government agencies / Communications carriers / Plants / Office buildings / Data centers, etc. (sales are also conducted via distributors, electrical construction companies, electrical machinery and communications device makers, and others)	<ul style="list-style-type: none"> Profit margins are high as we offer a one-stop service from design to manufacturing, construction, and maintenance Projects with high profit margin for national and local government offices are concentrated at the end of the fiscal year
	Energy storage systems (ESS) (Regular use field)	Power transmission and distribution operators / EPC* operators / Plants / Offices, etc.	<ul style="list-style-type: none"> Expansion of business can be expected
	Forklifts (For drive force)	Forklift makers / Maker distributors, etc.	<ul style="list-style-type: none"> Consistent revenue can be secured through replacement batteries
Automotive Lithium-ion Batteries	Automobiles For drive force: HEVs / PHEVs / Battery electric vehicles (BEVs) For starting & auxiliary equipment (12V lithium): HEVs / PHEVs / BEVs / ICEs	Japanese automakers, etc.	<ul style="list-style-type: none"> In principle, it is for new automobiles only as product lifespan is long R&D expenses are included in the segment Lithium-ion batteries for ESS manufacturing are also included Expansion of business can be expected
	Submarines Manned research submersibles Aircrafts Rockets Satellites Other special applications	Japanese government / Electrical machinery makers / Aircraft makers / Airlines / Special corporations, etc.	<ul style="list-style-type: none"> Lithium-ion batteries for submarines are posted on a progress basis, and stable sales and profits can be acquired Company-wide expenses are included in the segment

Battery applications

- For starting** For starting engines
- For auxiliary equipment** For starting systems for electric vehicles and backup for electrical devices
- Emergency use field** For backup use in case of emergencies in locations such as data centers and communication base stations

* A contract format whereby engineering, procurement, and construction are contracted out as a project.

Market Environment and the Company's Response

Forecast of domestic vehicle ownership

Estimated values based on changes in population distribution and income: 62,117 (2020), 61,256 (2030), 60,003 (2040), 58,226 (2050)

Values taking into consideration effects of sharing services: 58,951 (2020), 53,839 (2030), 50,155 (2040), 49,898 (2050)

Values in the case where sharing services become more common: 45,162 (2050)

Source: Prepared by GS Yuasa based on Mitsubishi Research Institute, Inc., Survey of Tax Revenue Simulations Regarding to Automobile-Related Tax Systems

The number of vehicles owned in Japan affects sales volume. In the long term, due to the declining population, the number of vehicles owned and new car sales in Japan are expected to gradually decrease. Therefore, the Company plans to strengthen profitability by establishing appropriate sales prices and enhancing the sales of high-value-added products, both for new automobiles and replacements.

Global trends in vehicle ownership forecast

Global trends in vehicle ownership forecast (Hundreds of millions of units)

Non-electric vehicles (ICE, etc.): 8.9 (2010), 10.8 (2015), 12.6 (2020), 13.9 (2025), 15.3 (2030), 16.7 (2035), 18.0 (2040), 19.4 (2045), 20.7 (2050)

Electric vehicles: Predicted to exceed 2 billion units by 2050.

Trends in vehicle ownership by region (Hundreds of millions of units)

2010: 8.9 (Total), 2015: 10.8 (Total), 2020: 12.7 (Total), 2025: 13.9 (Total), 2030: 15.3 (Total), 2035: 16.7 (Total), 2040: 18.0 (Total), 2045: 19.4 (Total), 2050: 20.7 (Total)

Source: Created by GS Yuasa based on Wood Mackenzie "No. of Road Vehicles (Car Parc)" (as of October 10, 2023).

Electrification is progressing in developed countries, but in other regions, internal combustion engine (ICE) vehicles will remain, and the number of ICE vehicles is not expected to decrease significantly. Therefore, the demand for lead-acid batteries for starting and auxiliary use is not expected to decrease significantly in 2035. Furthermore, the demand for lead-acid batteries in our main markets, ASEAN and Australia, is expected to remain stable. As such, the Company will continue to focus resources on ASEAN, Australia, and Europe, where demand is expected, aiming to further enhance profitability.

Domestic market for secondary batteries for storage battery systems for simultaneous use of power grid and renewable energy

Forecast of Power Supply Composition in Japan

2019: 18% (Renewable energy), 18% (Coal), 18% (Natural gas), 18% (Oil), 18% (Nuclear power, others)

2030 (projection): 18% (Renewable energy), 18% (Coal), 18% (Natural gas), 18% (Oil), 18% (Nuclear power, others)

2050 (forecast): 50% (Renewable energy), 3% (Coal), 18% (Natural gas), 18% (Oil), 18% (Nuclear power, others)

Source: Prepared by GS Yuasa based on Agency for Natural Resources and Energy, Considerations for Achieving Carbon Neutrality in 2050 and Summary of the Sixth Strategic Energy Plan

In Japan, numerous subsidy programs related to renewable energy have been announced, and it is expected that renewable energy will account for the majority of Japan's energy mix by 2050. On the other hand, since renewable energy generation fluctuates significantly depending on weather conditions and time of day, it may adversely affect the electric power grid. Demand for storage batteries is increasing as they play a key role in mitigating these output fluctuations. In FY2024, the Company is expanding production capacity for energy storage systems (ESS) to 1.3 times that of FY2023 to meet demand.

Global power train forecast

Global power train forecast (Million units)

2020: 80 (Total), 2021: 80 (Total), 2022: 80 (Total), 2023: 80 (Total), 2024: 80 (Total), 2025: 80 (Total), 2026: 80 (Total), 2027: 80 (Total), 2028: 80 (Total), 2029: 80 (Total), 2030: 80 (Total)

Source: Figures for 2023 and later are forecasts of vehicle volumes. Source: Prepared by GS Yuasa based on materials from securities companies

Environmental regulations on automobiles, with annual global sales exceeding 90 million units, are being strengthened worldwide, and the proportion of electric vehicles, such as HEVs and BEVs, is expected to increase significantly. In Japan, there is a goal to make all new car sales electric vehicles by 2035. The Company expects HEVs to remain the mainstream in the automobile market until the mid-2030s and is expanding production capacity to meet this demand. After 2030, EV and BEV numbers are expected to gradually increase. The Company is advancing research, development, and factory construction to begin mass production of batteries for BEVs starting in FY2027.

Scale of the global space industry market and forecast

Scale of the global space industry market and forecast (\$)

2017: 500,000, 2020: 1,000,000, 2025: 1,500,000, 2030: 2,000,000, 2035: 2,500,000, 2040: 3,000,000

The market is expected to grow by approximately three times over about 20 years.

Source: Prepared by GS Yuasa based on Morgan Stanley, Space: Investing in the Final Frontier

Forecast of demand for jet passenger aircraft

Forecast of demand for jet passenger aircraft (Aircraft)

2021: 5,714 (Existing aircraft), 18,341 (Demand for replacement of existing aircraft), 17,303 (New demand)

2041: 41,358 (Total)

Source: Prepared by GS Yuasa based on Japan Aircraft Development Corporation, Market Forecast for Civil Aircraft 2022-2041

The Company holds a large market share in the specialized batteries business, particularly in lithium-ion batteries for space and satellites. The global space industry market is forecasted to three times in size over the 20 years following 2017. We will continue to provide products with top-tier performance and quality, contributing to the development of the space industry. In the field of lithium-ion batteries for aircraft, the market for replacement batteries has been steady with the recovery from the COVID-19 pandemic. Significant growth is expected in the overall aircraft market, including both new and replacement demand.