Strategies and Businesses

Steadily Carry Out Growth Strategies by Leveraging the Strengths of Each Business Field

Top Message

Seeking Further Growth in an Environment of Lingering Uncertainty by Building a Robust Corporate Structure and Regarding Drastic Social Changes as Growth Opportunities

This section presents Toyota Industries' efforts to overcome the COVID-19 pandemic and achieve further growth.

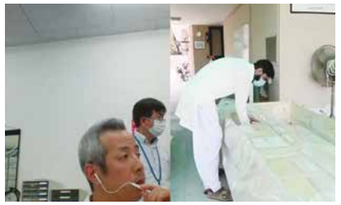
Akira Onishi President

1. Review of Fiscal 2021

In fiscal 2021, COVID-19, which has become a global phenomenon, repeated the cycle of expanding infections and winding down, and this difficult situation is likely to continue around the world with the exception of a few countries. I would like to take this opportunity to extend my condolences to people who have lost their lives to the pandemic and wish for an early recovery of those who are suffering from COVID-19.

Looking back over the past year, Toyota Industries was struck hard by the pandemic and fell into the red in the first quarter but succeeded in getting on a track to recovery in and after the second quarter. I believe this was made possible because we maintained our Group-wide profit improvement activities that started from well before the pandemic and worked to resume business activities on a full-scale in keeping with a recovery in the market. Observing market trends and the post-COVID-19 world, we need to determine which initiatives to retain, accelerate or undo and adapt to "new normal" work styles.

Operational test of a control system conducted remotely at Vanderlande



Providing work instructions to overseas servicing staff remotely from Japan in the Textile Machinery Business

2. Medium-Term Growth Scenario

In order to achieve growth over the medium term, it is essential to keep our eyes on changes in the market and make sure to seize growth opportunities.

Specifically, we regard two growth fields as having great potential. One is the Materials Handling Equipment Business encompassing logistics solutions to respond to changes in lifestyles, including more widespread use of e-commerce, and labor shortages. The other is responding to electrification in the automobile and other sectors. In these two growth fields, we will accurately capture changes in customer needs, leverage our strengths and turn them into business opportunities. The following highlights our major efforts in this regard.

Efforts in the Materials Handling Equipment Business

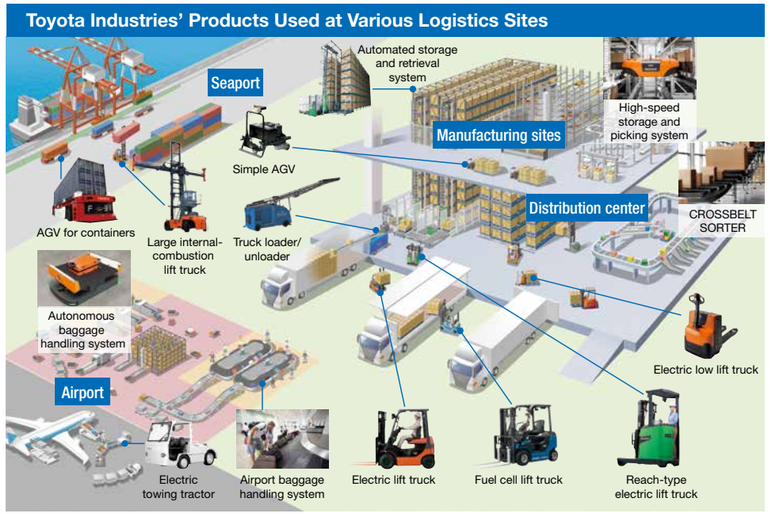
An increase in logistics volume is likely to continue with an expected post-pandemic recovery of the world economy and an expansion of e-commerce. In the logistics industry, labor shortages and a rise in labor costs are driving an increase in needs for mechanization and automation of logistics operations. These trends are expected to accelerate further, as new lifestyles and social distancing practices will become more prevalent as a result of COVID-19.

Under these circumstances, lift trucks and logistics solutions will play increasingly important roles. Demand for lift trucks is expected to remain strong due to their versatility. Along with expanding sales further, we will aim to contribute to customers throughout our entire value chain, including

after-sales services. As for a rise in needs for even greater efficiencies in distribution centers, which has been driven by an expansion of e-commerce, three companies in the Logistics Solutions Business, namely Bastian, Vanderlande and Toyota Industries, are collaborating to bolster business. The effort is beginning to bear fruit as evidenced by an increase in new orders in recent years. As one example of this collaboration, a system of Vanderlande has been adopted in a state-of-the-art distribution center established in Japan by a leading international logistics and parcel service operator.

We will make an accurate response to a broad range of customer needs by leveraging a wealth of know-how accumulated in dealing with customers worldwide as the top player in the lift truck market as well as synergies with logistics solutions.

In the Lift Truck Business, there has been a delay in acquiring certification from the environmental authority in the United States for engines to be fitted in certain models of internal-combustion lift trucks manufactured at a plant in the country (as of June 30, 2021). In 2021, we suspended their shipment and production in January and June, respectively. We offer our sincere apologies for the inconvenience and concern we have caused to our stakeholders. We are making our utmost efforts to resume shipment, including providing relevant information to the authority, and appreciate your understanding regarding the matter.




A system of Vanderlande introduced in Japan

Responding to Electrification

In the future, electrification is expected to gain momentum in a variety of fields due to the enforcement of more stringent fuel efficiency regulations and growing energy-saving awareness among customers. Amid this environment, Toyota Industries will make maximum use of our technologies in the materials handling equipment and automobile-related fields and increase our competitive edge by encouraging collaboration among these fields.

● Electrification of Materials Handling Equipment (Lift Trucks and Others)

Electrification of lift trucks started much earlier than automobiles, and more than 70% of our annual lift truck sales are already electric. These lift trucks are used mainly in distribution warehouses and food manufacturing factories as they emit no exhaust gas and are quiet to operate. We are working to increase the appeal of our products by developing motors, controllers and other key components internally. We will also augment the development of high value-added products. One such product is a lift truck equipped with lithium-ion batteries that enable continuous operation thanks to a shorter charging time. Another is a fuel cell lift truck with excellent environmental performance, not emitting CO_2 or NOx while in operation. Through these efforts, we aim to remain a leader in the market with the electrification of materials handling equipment.

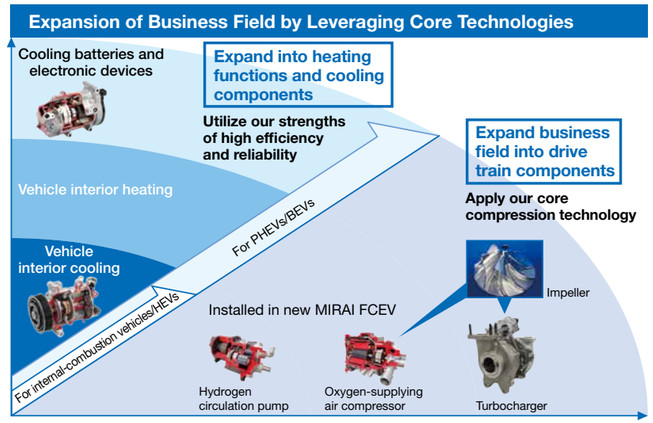

Lift truck equipped with lithium-ion batteries


Fuel cell lift truck

● Car Electrification

With the progress of car electrification, electric vehicles have become a frequent topic of conversation in our society. However, from a global perspective, we expect demand for various types of electrified vehicles to increase, not just for battery electric vehicles (BEVs) but also for hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs) and fuel cell electric vehicles (FCEVs), depending on the market characteristics in each region and usage by customers. We will respond to car electrification by providing products, which can be adopted in a broad range of electrified vehicles, in the fields of car air-conditioning compressors and electronic components.

For example, in the field of car air-conditioning compressors, we are expanding sales of electric compressors to automakers across the world. With the emerging need to cool batteries, we see great growth potential in this field, including components for drive systems.



In the electronics field, there has been a rise in demand from the perspective of social infrastructure for AC inverters as an emergency power source. Combined with the RAV4 PHV's system to feed power externally, we seek to increase their use in evacuation shelters and similar locations. For on-board batteries, we have accumulated a variety of knowledge through many years of research and development. This is a fiercely competitive sector, but we will turn it into another growth pillar, following materials handling equipment and car air-conditioning compressors, by offering batteries with unique characteristics and a high competitive edge.


Disaster prevention drill using AC inverter's external power feeding system

3. Future Direction of Management

Changes in the External Environment

Even though there are many views on the post-pandemic society, no one knows for sure what it will be like. However, we have already witnessed several changes in how we live and work.

The transformation of society and lifestyles is expected to continue into the future, and changes that relate to our businesses include an increase in online transactions as seen in the further expansion of e-commerce. Additionally, environmental initiatives will be of even greater importance for companies, as green investments are spreading in an unprecedented scope. We also expect the progress in digitalization will entail changes in the industry structure.

Our Response

In responding to drastic changes, it will be crucial, more than anything else, to place top priority on safety while thoroughly ensuring quality, compliance and other basic matters.

As for quality, we will strive for an even higher level of quality by utilizing advanced technologies based on digital transformation (DX) on top of our ongoing efforts to maintain and improve quality. For example, we have newly developed AI to predict product defects in the aluminum die-casting process for car air-conditioning compressors and are now exploring its applications in further improving quality and productivity. In the future, we will leverage such digital technologies to transform our operations and business models.

After thoroughly ensuring basic matters such as these, it will be important to proceed with the creation of a flexible and lean organization in order to capture the aforementioned changes in society as new growth opportunities. We will channel our management resources into focused areas and leverage our own strengths to constantly create innovative products and services.

Our basic approach to promoting these efforts is to provide products and services that are needed by customers and are helpful to society, as embraced in the Toyoda Precepts (corporate creed). This stance will remain unchanged.

Besides observing laws and regulations, another crucial element in ensuring corporate governance is that everyone, from top management to individual employees, respects the culture of each region and understands and trusts each other. We need to do more than just establishing a governance system for the sake of formality, but rather render it actually functional and effective. As such, our continued aim is to operate the system in a manner to further improve the efficiency, fairness and transparency of management. With regard to our relationships with companies in the Toyota Group, we will continue to reinforce collaboration in various ways to survive the difficult environment, since competition is increasingly intensifying in the automobile industry and automobile-related businesses form the core of our *monozukuri* (manufacturing).

Environmental protection is a theme of growing importance for manufacturers, including Toyota Industries. We will continue to focus on this area under the Global Environmental Commitment and in accordance with the Environmental Vision 2050 and the newly formulated Seventh Environmental Action Plan. (See pages 64–65.) In the “Responding to Electrification” section of this message, I have explained about electrification in the lift truck, car air-conditioning compressor and electronics product sectors. However, our environment-friendly products, such as electrified or fuel-efficient products, actually cover every sector of our businesses. As examples, in the Vehicle Business, more than half of the RAV4 manufactured by Toyota Industries are HEVs and PHEVs. In the Engine Business, we also manufacture gasoline engines for HEVs. Our textile machinery products, which form our founding business, are renowned for their energy-saving performance. In the future as well, we will continue to fulfill our role as a manufacturer in protecting the global environment. (See Special Feature 2 “Contributing Both in Terms of Product Development and Production to the Establishment of a Carbon Neutral Society” on pages 22–25 for our environment-friendly products.)

Motor housing for an electric compressor manufactured by aluminum die-casting

Founder Sakichi Toyoda

Toyoda Precepts (Corporate Creed)

Carrying out the spirit of founder Sakichi Toyoda,
- Always be faithful to your duties, thereby contributing to the Company and to the overall good.
- Always be studious and creative, striving to stay ahead of the times.
- Always be practical and avoid frivolousness.
- Always strive to build a homelike atmosphere at work that is warm and friendly.
- Always have respect for God, and remember to be grateful at all times.

Environmental Vision 2050 under the Global Environmental Commitment

(1) Establishing a carbon neutral society
(2) Establishing a recycling-based society
(3) Reducing environmental risk and establishing a society in harmony with nature
(4) Promoting environmental management

RAV4 PHV

Gasoline engine for HEVs

4. In Conclusion

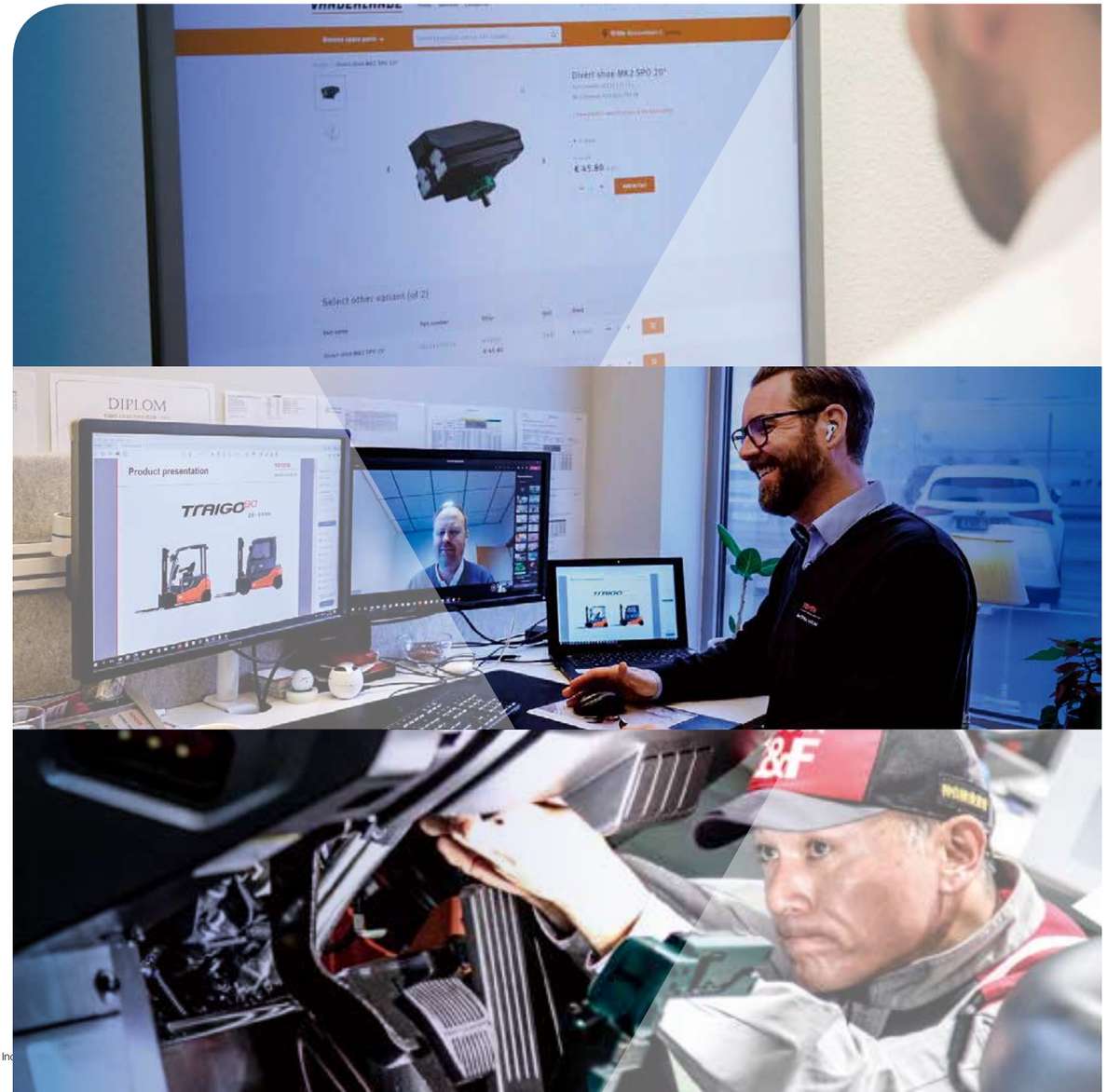
Since we were founded in 1926 to manufacture and sell an automatic loom invented by founder Sakichi Toyoda, we have attained sustainable growth by adapting our business portfolio to changes in society and customer needs and accordingly extending our reach in the automobile-related and materials handling equipment fields. The idea underpinning our growth basically aligns with the environmental, social and governance (ESG) concept and the United Nations’ Sustainable Development Goals (SDGs) in that we seek to respond to social issues from a long-term perspective.

To date, we have endeavored to develop a variety of competitive products and accumulate technologies and know-how. We have also built relationships of trust with our stakeholders, including business partners and customers, as we engage with them from a long-term perspective. Capitalizing on these tangible and intangible assets, we intend to strengthen business even further in order to attain growth over the medium to long term.

Taking the Initiative for Growth – 1

Contributing to Logistics Efficiencies of Customers by Providing Support throughout the Logistics Lifecycle

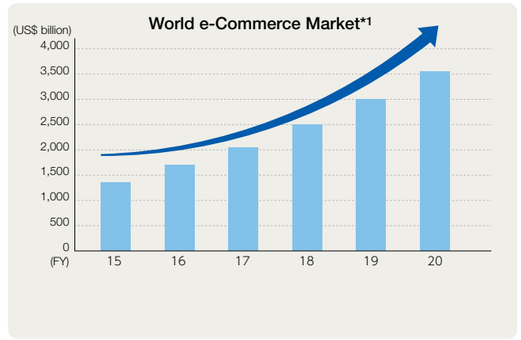
The needs for automation and labor saving in logistics operations are growing, driven mainly by a higher logistics volume on the back of an expanding world economy and a growth in e-commerce transactions as well as by the spread of COVID-19. Toyota Industries' Materials Handling Equipment Business provides support throughout the value chain encompassing from the sales of lift trucks and other materials handling equipment to the provision of after-sales services. Leveraging the comprehensive strengths of engaging in the Lift Truck Business and Logistics Solutions Business, we are striving to assist customers in attaining greater logistics efficiencies.



Importance of Logistics and Market Growth Potential

In acting as a lubricant for economic activities, logistics have come to play an important role in our daily lives.

Recently, logistics volume has been progressively increasing year after year marked by a rising global population and expanding economies. With the growth of the e-commerce market, the trend toward a higher logistics volume is expected to continue for the foreseeable future. In addition, a labor shortage in developed countries and a surge in labor costs mainly in emerging countries have converged to drive a further increase in needs for greater logistics efficiencies.



Offering Support throughout the Logistics Lifecycle

It is important to conduct proper maintenance on materials handling equipment and systems and keep them in optimum operating condition to maximize the efficiency of logistics sites. Toyota Industries has in place a structure that customers can rely on by establishing extensive sales and service networks throughout the world and assigning highly skilled staff.

Moreover, we leverage the know-how nurtured by responding to various needs required at global logistics sites and propose the most advantageous solutions for logistics improvements for each and every customer.

In the future as well, we are committed to contributing to better logistics efficiencies by offering support to customers throughout the logistics lifecycle extending from after-sales services to fleet management and preventive maintenance utilizing IT technologies, lift truck leasing, consulting for logistics improvements and other logistics solutions.

Strengths of Toyota Industries' Materials Handling Equipment Business

Lift Truck Business

- Product differentiation on the back of key components developed in-house
- Broad product lineup, including global top-share*2 lift trucks
- Utilization of IT technologies for fleet operation management and more efficient and sophisticated services
- Globally extensive sales and service networks
- Highly experienced and skilled service staff
- Proposals for improvements at logistics sites based on long-accumulated experience and Toyota Production/Logistics Systems
- Customer support throughout the lifecycle of products

Logistics Solutions Business

- Collaboration with the Lift Truck Business, which boasts a top market share*2
- Synergistic effects through a complementary relationship among Toyota Industries, Bastian and Vanderlande
- Extensive product lineup and excellent software development competence
- Business structure extending throughout the world
- Well-balanced sales composition in such sectors as e-commerce, parcel and airport-related businesses

The following pages introduce case examples in which we leveraged these strengths to successfully contribute to greater logistics efficiencies of customers.

*2: Survey by Toyota Industries Corporation

Case Example 1 Providing a Stable and Efficient Logistics Environment through Extensive After-Sales Services

One of Toyota Material Handling Japan's (TMHJ) strengths lies in its ability to render solid support to customers' logistics environments through comprehensive after-sales services provided by highly experienced and skilled service staff. Offering full maintenance services, including preventive maintenance, contributes to avoiding unexpected breakdowns and realizing customers' stable and efficient logistics operations.

Sobu Logistics Corporation

Sobu Logistics Corporation is responsible for logistics operations in Japan for the Kikkoman Group, which manufactures and sells condiments and processed foods. The company is consigned to provide comprehensive logistics operations, from receiving orders to purchasing products, of Kikkoman Corporation and Kikkoman Foods, Inc.

Entrusted with Lift Truck Management

One of the strengths of Sobu Logistics Corporation is to operate six distribution center warehouses and 40 truck terminals that enable products to be delivered on the following day of orders placed.

Lift trucks play a critical role of delivering products to customers in the optimum condition on time. At the Noda Delivery Center, where an average of 1,200 tons of Kikkoman products are shipped every day, approximately 40 lift trucks are in use for loading/unloading operations. Including lift trucks used at other distribution center warehouses, Sobu Logistics possesses more than 100 lift trucks. With numerous lift trucks in operation, the company had been faced with lift truck management issues such as arranging for repairs in times of unexpected breakdowns, incurring high maintenance costs and keeping track of the number of lift trucks required at any given time.

TMHJ conducted a multifaceted study on operating hours, traffic lines and other aspects of Sobu Logistics' lift trucks and proposed an optimum logistics environment, which resulted in Sobu Logistics entrusting TMHJ with the management of all their lift trucks. Providing full maintenance services, including preventive maintenance, has contributed to decreasing unexpected breakdowns of lift trucks and reducing or leveling out maintenance and management costs. This has made it unnecessary to retain backup lift trucks, thereby reducing the total number of vehicles.

[Customer's Voice]

In our business, we tend to place an extra load on our lift trucks, but we find Toyota lift trucks very reliable. TMHJ service staff quickly arrive when we need them, make proposals for an appropriate model and the number of lift trucks corresponding to changes in our operating situation and make recommendations for the proper timing of truck replacements. In these and other ways, we are extremely satisfied with TMHJ's swift response.

Mr. Hiroshi Tobe
President
Sobu Logistics Corporation

Case Example 2 Utilizing Telematics Functions to Increase Safety and Reduce Costs

Improvements in information and communication technology have advanced the use of the Internet of Things (IoT) in society. As such, the role of telematics technologies in the fleet management of lift trucks has become increasingly important. Toyota Material Handling Europe's (TMHE) Toyota I_Site fleet management system harnesses cutting-edge technologies and the know-how cultivated through various improvement activities to make it possible to comprehend the operating status of lift trucks in real time and establish a safe and reliable logistics environment.

Danske Fragtmænd

Danske Fragtmænd is Denmark's largest logistics operator boasting more than a 100-year history. With more than 40,000 business customers, the company offers high-quality logistics services including next-day deliveries anywhere in the country.

Responding to Stringent Safety Requirements and Offering Support to Customers

With an ever-increasing package volume for delivery, Danske Fragtmænd is striving to ensure the safety of its lift truck operators. Approximately 40 lift trucks are in operation within a limited space at their warehouse in Taulov, and the company wanted to reduce impacts between lift trucks and racks or loads, or collisions between lift trucks. To resolve this issue, TMHE made a proposal to utilize Toyota I_Site to raise safety awareness among lift truck operators and reduce accidents.

Should an accident occur, the fleet management system makes it possible to identify the date and the pattern of the impact as well as which lift truck was involved and the driver. The system also evaluates each operator's operation from safety and environmental aspects, such as hard braking, sudden acceleration and other reckless driving practices as well as the fuel consumption status, thereby contributing to increasing the safety awareness of operators. In addition, Toyota I_Site helps the company to reduce management costs by understanding the operational status of each lift truck in detail in real time, which in turn enables the optimization of the number of lift trucks needed for its logistics operations.

[I_Site Manager's Voice]

The customer has been greatly benefiting from the introduction of Toyota I_Site. When an accident has occurred, the customer can easily identify which lift truck and which operator was involved, allowing them to quickly make appropriate responses. Such incidents are also recorded in the system, which makes it easier to instruct operators to practice safe driving.

Mr. Søren Vester
I_Site Manager
Toyota Material Handling Denmark

Contributing Both in Terms of Product Development and Production to the Establishment of a Carbon Neutral Society

Toshihiko Shimizu
Senior Executive Officer
Head of the Production Engineering Development Center, Die Engineering Center, Quality Control Dept. and Plant Engineering & Environment Dept., Production Headquarters
(As of March 31, 2021)

Environmental Vision 2050

As one tenet under our Basic Philosophy, Toyota Industries works to contribute to making the earth a better place to live and enriching lifestyles and also strives to offer products and services that are clean, safe and of high quality. Accordingly, we have established the Global Environmental Commitment, a specific environmental action guideline, and have been sharing and implementing it throughout the Toyota Industries Group.

We recognize that contributing to the establishment of a carbon neutral society is an important issue under the commitment. As such, we have been promoting initiatives in various fields, such as electrification, weight reduction, energy savings and adoption of renewable energy sources in seeking to realize a zero CO_2 emissions society in 2050.

Notional Diagram of Global Environmental Commitment

(1) Establishing a carbon neutral society
➡ Globally take on challenge of establishing a zero CO_2 emissions society

(2) Establishing a recycling-based society
➡ Take on challenge of minimizing the use of resources

(3) Reducing environmental risk and establishing a society in harmony with nature
➡ Generate positive influence on biodiversity

(4) Promoting environmental management
➡ Enhance consolidated environmental management and promote enlightenment activities

Review of the Sixth Environmental Action Plan — Establishing a Carbon Neutral Society —

Positioning the establishment of a carbon neutral society as our most crucial environmental issue, Toyota Industries has been carrying out production activities with a constant focus on saving energy. At the same time, we have accelerated the development of more environment-friendly products.

Under the Sixth Environmental Action Plan, a five-year plan implemented from fiscal 2017 to fiscal 2021, our two primary action policies were to "develop products and technologies possessing the utmost level of environmental performance" and "develop and introduce production engineering technologies with lower CO_2 emissions and utilize clean energy." We have steadily undertaken tasks defined for each policy and successfully achieved respective targets. Please see pages 62–63 for details.

Approach of the Seventh Environmental Action Plan — Establishing a Carbon Neutral Society —

We have formulated a next plan, the Seventh Environmental Action Plan covering five years from fiscal 2022 to fiscal 2026.

With regard to products, we will emphasize reduction of CO_2 emissions as early as from the technology development stage while further pursuing better energy-saving performance, lighter weight and development of technologies responding to electrification. In terms of production, while making all-out efforts to save energy, we will define a global target of total CO_2 emissions and work toward the target so that we can curb emissions as we expand business. In addition, we will actively adopt renewable energy sources on a global basis by setting a target introduction rate. Please see pages 64–65 for details.

Steady Progress in Five Years

FY2017	FY2018	FY2019	FY2020	FY2021
Certified as an environment-friendly product (gene B)	Certified as an environment-friendly product (towing tractor)	Opened H_2 PLAZA Hydrogen Station (Takahama Plant)	Added a 1.8-ton model to the lineup of fuel cell (FC) lift trucks	Oxygen-supplying air compressor for FCEVs
Saved energy by using intermittent air blow	Energy-saving equipment utilizing *karakuri* mechanical systems winning a Good Idea Award in the Karakuri KAIZEN Exhibition	Reduced energy used in a vehicle painting dry-off oven	Achieved a zero CO_2 emissions plant for the first time in the Group (TMHMS)	Reduced CO_2 emissions by creating energy-saving production lines linked to product designs

Reducing CO_2 Emissions in Product Development

Toyota Industries develops products with excellent environmental performance by sharing and encouraging the evolution of technologies and know-how of each business, mainly the Materials Handling Equipment Business and the automobile-related businesses.

This section highlights our efforts related to electrification, which is key to developing products that can reduce CO_2 emissions.

Automobile-Related Businesses

We develop and manufacture devices for a range of electrified vehicles, from hybrid electric vehicles (HEVs) to fuel cell electric vehicles (FCEVs), and enjoy the world's top share*1 in the car air-conditioning compressor and electronics fields.

*1: Survey by Toyota Industries Corporation

Car Air-Conditioning Compressor

■ Providing Products with Excellent Energy-Saving Performance

Tomoji Tarutani
General Manager, Engineering Dept., Compressor Division
(As of March 31, 2021)

Sales of various electrified vehicles, including HEVs, plug-in hybrid electric vehicles (PHEVs), battery electric vehicles (BEVs) and FCEVs, are increasing in line with the growing need for car electrification.

Car air-conditioning compressors mounted on these electrified vehicles also need to be electric, and the most important aspect of their performance is electric efficiency, which is directly linked to the cruising range.

Besides requiring the same level of precision processing and assembly technologies used for conventional compressors for internal-combustion vehicles, electric compressors need another important technology to ensure compatibility with newly added electronic components. Taking advantage of our strengths in these technologies, we have successfully achieved high electric efficiency performance.

Since being adopted in the Prius of Toyota Motor Corporation (TMC), we have been providing compressors for various electrified vehicles of automakers in and outside Japan for about 20 years, accumulating a pool of related technologies and know-how along the way. Additionally, as BEVs face a problem of lower electric efficiency when a heater is turned on, we have developed a compressor for heat pump air conditioning systems to help improve electric efficiency while heating.

ESB20 electric compressor

■ Compressors Also Used for Cooling Key Components

In recent years, following car electrification and widespread use of autonomous driving technology, there has been a growing need to cool electronic devices, batteries and other key heat-emitting components. In response, we have developed a large-capacity model used not only for vehicle interior air conditioning but also for cooling those key components. As products in this field relate to the driving performance of automobiles, we believe that the reliability of our products will serve as an even greater strength of Toyota Industries.

■ Utilizing Compression Technologies to Provide Drive System Components

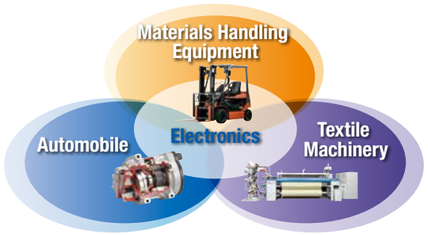
For FCEVs, which are a type of electrified vehicle that generates electricity through a chemical reaction of hydrogen and oxygen, we have applied compression technology of car air-conditioning compressors and developed such products as an oxygen-supplying air compressor, which efficiently compresses and supplies oxygen. The product is already fitted in the MIRAI.

By leveraging our elemental technologies, we intend to increase our role in the fields that relate to the driving functionality of FCEVs, which are said to be the "ultimate eco-car."

Products Utilizing Compression Technologies

Oxygen-supplying air compressor

Hydrogen circulation pump



Electronics

Further Improving Environmental Performance of Power Source Devices and Helping to Promote Electrification in Each Business

Takashi Kubooka
General Manager, Engineering Dept., Electronics Division
(As of March 31, 2021)

In the field of car electronics, we develop and manufacture on-board power source devices, including DC-DC converters, on-board chargers and AC inverters, and charging stands by utilizing power electronics as the core technology. By selling these products to automakers, mainly TMC, we are working to contribute to the widespread use of electrified vehicles.

The progress in car electrification and automation has raised expectations for more diverse power source devices with higher performance (higher efficiency as well as size and weight reduction). Accordingly, we will pursue even higher environmental performance and expand the scope of our development efforts to power source system products. Moreover, we are seeking to improve environmental performance by applying the technology and know-how accumulated in the development of power source devices to our other products, such as materials handling equipment and textile machinery. Our plan is to increase our contribution to the establishment of a carbon neutral society by promoting electrification in each business field, including car electronics.

Materials Handling Equipment Business

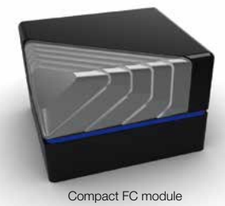
Toyota industries offers a wide range of industrial vehicles such as towing tractors, low lift trucks, automatic guided vehicles (AGV) and lift trucks, which have the global top market share*2. Since releasing our electric lift trucks to the market in the 1970s, many products have been electrified, and we are working to strengthen the competitiveness of our products through in-house production of key components such as motors, inverters and electronic control units (ECU).

*2: Survey by Toyota Industries Corporation

Haruhiko Otsuka
General Manager, Engineering Dept., Toyota Material Handling Japan
(As of March 31, 2021)

Offering Trucks Equipped with Lithium-Ion Batteries or Fuel Cells

In addition to the conventional electric lift truck, in 2016 we launched a lithium-ion battery installation type that significantly shortens the battery charging time. The truck does not require the replacement of heavy batteries, which can reduce the burden on the operator.



Compact FC module

In the same year, an FC lift truck was released. The FC system installed in this product was developed for realizing the features of the lift truck, utilizing the fuel cell used in the MIRAI developed by TMC. In February 2021, we developed a new general-purpose small fuel cell module. This module packages FC system components for the generation of electricity and achieves high power generation efficiency. It's also relatively easy to install in various existing engine-powered products. In the future, we aim to supply the module as a stationary power generator to plants and commercial facilities and install it in industrial vehicles and buses.

Efforts to Increase the Percentage of Electrification of Large Models

The electrification rate of the entire lift truck market has already exceeded 60%, but the electrification of large models has not progressed much due to the lack of power compared with internal-combustion models. Toyota Industries will utilize its key component technology cultivated in electronics as well as truck control technology to advance the development of high-output and high-voltage components and improve the electrification of large models.

Lead-Acid Battery Type

- Equipped with an internally developed high-efficiency motor, etc.
- Lower energy cost resulting from longer uptime

Lithium-Ion Battery Type

- Much shorter charging time
- Less burden of battery replacement
- Equipped with T_Site telematics as standard for easier fleet management

Fuel Cell Type

- No CO_2 emissions while in operation
- Excellent environmental performance
- Enhanced convenience of completing fuel charging in three minutes

Reducing CO_2 Emissions in Production Activities

The two pillars of Toyota Industries' efforts to reduce CO_2 emissions in its production activities are promoting thorough energy savings and utilizing renewable energy. The following shows examples among such efforts in this area.

Promoting Thorough Energy Savings

In implementing thorough energy savings, we are making proactive, Company-wide efforts to "develop and introduce production engineering technologies with lower CO_2 emissions" and "fully implement improvement activities on a daily basis." For the former, the Nagakusa Plant, a vehicle assembly plant in Aichi Prefecture, undertook an improvement project with a focus on minimizing the amount of heat used in a painting dry-off oven and suppressing heat dissipation, thus successfully achieving lower energy loss and a subsequent, drastic reduction in CO_2 emissions. The project won the 2019 Minister of Economy, Trade and Industry Award in the Industrial Field, which is the highest award in the Energy Conservation Grand Prize program (Energy Saving Projects Category) run by the Energy Conservation Center, Japan.

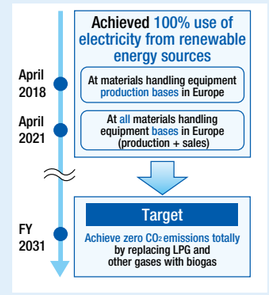
2019 Energy Conservation Grand Prize

Utilizing Renewable Energy

As part of an effort to utilize renewable energy, we are proactively introducing clean energy.

Toyota Material Handling Europe AB (TMHE), a subsidiary serving as the regional headquarters of the materials handling equipment business in Europe, has formulated a two-pronged policy aimed at zero energy *muda* (waste) and zero carbon emissions by fiscal 2031. As an interim target, TMHE has worked to increase the ratio of electricity from renewable energy sources to 100% at all of its bases by fiscal 2021.

To achieve this target, TMHE has selected the one that best matches each base from among three options: power contracts for renewable energy power generation, renewable energy certificates and in-house power generation. As a result, all of its five production bases and all 28 non-production companies achieved the interim target in fiscal 2019 and in April 2021, respectively. TMHE became the first company in the materials handling equipment industry to achieve 100% use of electricity from renewable energy sources at all bases in Europe.



In 2019, Toyota Material Handling Manufacturing Sweden AB (TMHMS), a TMHE Group company, went a step beyond using electricity from renewable energy and introduced biogas in place of liquefied petroleum gas (LPG), thereby becoming the first zero CO_2 emissions plant in the Toyota Industries Group.

TMHE is undertaking activities to switch all energy sources used at business sites to renewable energy by 2030.

Summary

As highlighted in this section, Toyota Industries is aggressively working to reduce CO_2 emissions both in terms of products and production toward the establishment of a carbon neutral society. As a result of such efforts, we were selected for the A List, the highest rating, for three consecutive years in a survey conducted on climate change by CDP*3, a U.K.-based international environmental NGO.

As for products, we expect that more stringent environmental regulations in various countries and growing energy-saving consciousness among customers will further accelerate the electrification of cars and materials handling equipment in the future. Amid this environment, we will holistically leverage our broad range of technologies accumulated in the automobile-related businesses and Materials Handling Equipment Business to further reinforce our development efforts geared toward electrification.

In terms of production, we have announced our target to reduce CO_2 emissions by 25% in fiscal 2026 from the fiscal 2014 level in becoming carbon neutral (zero CO_2 emissions) in 2050. Actually, however, we are aiming for an even more ambitious target of achieving a 50% reduction by fiscal 2031 from the fiscal 2014 level. We recognize that thorough improvement of our energy use efficiency and effective introduction of renewable energy will be crucial in achieving this target. Specifically, we will need to minimize and utilize exhaust heat from foundry and other processes, which form a distinctive part of our business. In promoting the utilization of renewable energy, we will extend the regionally unique effort first undertaken by our bases in Europe to the entire Group while defining new targets. Simultaneously, we will take up a challenge of spurring innovation in manufacturing to achieve carbon neutrality. The challenge will include introducing production engineering technologies that have undergone repeated discussions on CO_2 reduction from the product design stage. Further endeavors will also entail proactively carrying out demonstration and introduction of new carbon neutral technologies, such as the use of hydrogen and capturing of CO_2 at plants, for establishing a CO_2 circulation system at a model plant.

We will continue to make proactive efforts to reduce CO_2 emissions both in terms of products and production and contribute to the creation of a carbon neutral society.

*3: An international NGO running a project in which institutional investors work together and request companies around the world to disclose their strategies against climate change and greenhouse gas emissions data

Business Activities

Materials Handling Equipment

As a market leader with an extensive knowledge of global logistics needs, Toyota Industries provides a range of materials handling equipment, mainly lift trucks, and logistics solutions to customers.

Link to product details

Medium-Term Direction of Business

We will work to develop and propose new products and services incorporating cutting-edge technologies through the proactive use of open innovation and co-creation with customers.

Our goal is to become the logistics solutions partner of the first choice for customers by meeting their wide-ranging needs and helping them increase their logistics efficiencies based on the Toyota Industries Group's comprehensive strengths covering both the lift trucks and logistics solutions fields.

Business Characteristics

Strengths

- An extensive logistics-related product lineup both for lift trucks (internal-combustion type, electric type, fuel cell (FC) type, etc.) and logistics solutions products (automated storage and retrieval systems, automatic guided vehicle (AGV) systems, automated lift trucks, etc.)
- High technological capabilities, including those linked to environmental and safety performance
- Production know-how that ensures high levels of quality and production efficiency
- Global, well-developed production, sales and service networks
- An extensive value chain encompassing in-house development and production of engines, motors and other key components; total after-sales services including maintenance and inspections as well as operational management; and sales financing operations offering more options in sales
- No. 1*1 in lift truck unit sales in the world
- A wealth of experience and know-how as well as a global network in the Logistics Solutions Business
- Software development capability to create such systems as a warehouse management system

*1: Survey by Toyota Industries Corporation

Opportunities

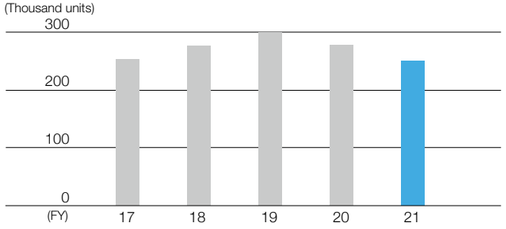
- An expansion of global logistics volume in line with an increase in the world population and economic growth
- Growing need for electric lift trucks and products with high fuel efficiency and low environmental impact following enforcement of more stringent environmental regulations around the world
- Rising need for higher logistics efficiencies prompted mainly by a growth in e-commerce transactions as well as soaring labor costs and labor shortages
- Growing need for automation and labor saving driven by the emerging need for contactless operations due to COVID-19
- Increased recognition that logistics is an essential business

Risks

- Restrained capital investment due mainly to a slowing economy and disasters
- Weaker sales due to intensifying competition
- Change in business environment triggered by an expanding market of low- to mid-priced lift trucks
- Suspension of production caused by supply chain disruptions
- Weaker demand for internal-combustion lift trucks resulting from more stringent environmental regulations
- Emergence of next-generation robotics products as an alternative to lift trucks

Net Sales	Operating Profit
FY2020	FY2020
¥1,436.3 billion	¥102.2 billion
FY2021	FY2021
¥1,431.4 billion	¥109.9 billion

Materials Handling Equipment Sales



Business Overview in Fiscal 2021

The lift truck market in 2020 turned downward except for China, where sales continued to increase. Amid this operating climate, Toyota Industries engaged in sales and after-sales service activities matched to respective markets. However, unit sales of lift trucks for fiscal 2021 were down 28,000 units, or 10%, to a total of 250,000 units from the previous fiscal year. Meanwhile, as the need for higher logistics efficiencies in warehouses is getting stronger, underpinned by an expansion of the e-commerce market, Toyota Industries made efforts for reinforcement of the Logistics Solutions Business through collaboration with subsidiaries in the United States and Europe. Net sales in fiscal 2021 were roughly on par with the previous fiscal year at ¥1,431.4 billion.

Business Structure

Toyota Industries' Materials Handling Equipment Business is operated under a two-organization structure: Toyota Material Handling Group (TMHG) responsible for the Lift Truck Business and Toyota Advanced Logistics Group (TALG) engaging in the Logistics Solutions Business. TMHG and TALG collaborate with each other to achieve overall growth of the Materials Handling Equipment Business while reinforcing individual businesses.

Toyota Material Handling Group (TMHG)

Toyota Industries assists customers worldwide in attaining greater logistics efficiencies as a market leader in the materials handling equipment and logistics fields by delivering optimal logistics solutions based on its comprehensive strengths to respond to their specific and ever-changing needs on a global scale.

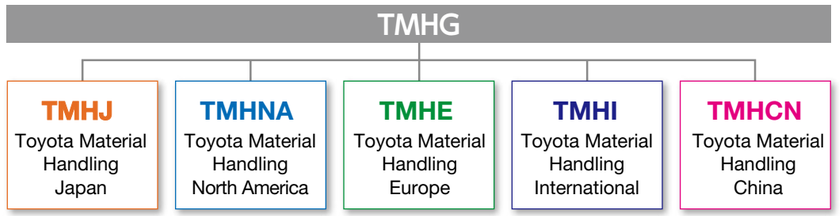
Under the TMHG management structure, we engage in the Lift Truck Business under the TOYOTA, BT, RAYMOND, CESAB and Tailift brands. Mutually utilizing the development and sales strengths of each brand, TMHG is promoting business globally.

We basically carry out product development in three regions, namely Japan, North America and Europe. Based on this structure, we develop and manufacture products in each region, which are matched to the specific local needs and characteristics, and ensure quick product delivery to customers. At the same time, we seek greater product appeal by conducting in-house development and production of such key components as engines and motors, which greatly influence the performance of lift trucks. In response to the enforcement of stricter environmental regulations and growing eco-consciousness worldwide, we are improving the energy-saving performance and enhancing our electric lift truck lineup. We are also promoting the development of autonomous driving technology as a response to growing needs for greater logistics efficiencies mainly driven by labor shortages.

In addition to supplying high-quality products, we consider our strength to be able to support customers throughout our entire value chain that encompasses from providing after-sales services through our extensive networks to offering sales financing operations. On the sales front, we are offering products and logistics improvement solutions optimally matched to individual customers' logistics sites. Simultaneously, we are responding to needs for fleet management that optimizes the operation of multiple lift trucks for customers conducting business globally. In terms of services, we assign experienced and highly skilled personnel and utilize leading-edge information technology (IT) to provide finely tailored services to customers. Our service personnel visit customers on a periodic basis and provide maintenance services to prevent troubles from occurring. When a problem does occur, they swiftly make a visit to the customer and promptly take appropriate action. We are also strengthening our internal sales financing operations mainly in Europe, the United States and other developed countries in order to flexibly respond to customers' diverse needs, including those for fund procurement, in the area of equipment sales.

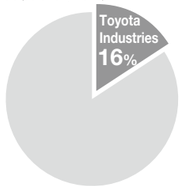
Additionally, TMHG is collaborating with TALG to create synergies between the lift trucks and logistics solutions fields in development and other domains.

Toyota Material Handling Group



The Toyota Material Handling Group possesses several brands such as TOYOTA, BT and RAYMOND and engages in business by dividing the world into five areas: TMHJ (Japan), TMHNA (North America), TMHE (Europe), TMHI (Asia, Australia, etc.) and TMHCN (China).

Toyota Industries' Global Lift Truck Market Share
(Survey by Toyota Industries Corporation, 2020)



World No. 1

Main Products

Electric lift truck | Reach-type electric lift truck | Electric low lift truck | Internal-combustion lift truck | Automated lift truck

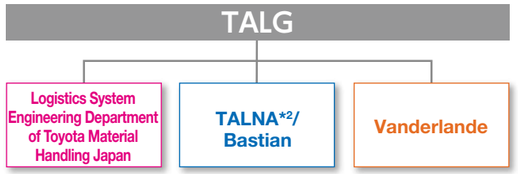
Toyota Advanced Logistics Group (TALG)

With accelerated expansion of the e-commerce market due in part to the growing need for contactless operations as a result of COVID-19, the need for logistics automation has been on the rise across the world. This has entailed increases in the number and size of distribution centers, which in turn have necessitated solutions for more advanced logistics issues.

Amid this environment, we go a step beyond just providing a broad range of materials handling equipment and associated software programs and are reinforcing our Logistics Solutions Business to more meticulously satisfy each customer's varying needs by leveraging our logistics improvement know-how accumulated to date.

Under the TALG management structure, the Logistics System Engineering Department of Toyota Material Handling Japan, U.S.-based Bastian Solutions LLC and Netherlands-based Vanderlande Industries Holding B.V. are collaborating with each other in development, sales and other activities to expand business while leveraging their individual strengths.

Toyota Advanced Logistics Group



*2: Toyota Advanced Logistics North America (Holding Company of Bastian)

Under TALG, the Logistics System Engineering Department of Toyota Material Handling Japan, Bastian and Vanderlande work together to promote the Logistics Solutions Business on a global scale while leveraging their individual strengths.

Main Products and Systems


Automated storage and retrieval system


Simple AGV


Sorter


High-speed storage and picking system


Airport baggage handling system

Business Activities in Fiscal 2021

Despite dropping sharply due to COVID-19, the world's lift truck market grew overall in 2020 as evidenced by a recovery trend after bottoming out in the first quarter in China and in the second quarter elsewhere. Over the full year, the market expanded considerably year on year in China, but shrank slightly from the previous year's level in Japan, North America, Europe and other emerging countries. Amid this environment, we worked to enhance the product appeal of our mainstay lift trucks and expand sales. We also strove to offer reliable after-sales services, enhance responsiveness to large-order customers and provide solutions for logistics issues through the introduction of optimally packaged systems.

In the field of lift trucks, we made efforts to increase our product lineup in each region and promoted the development of autonomous driving technology internally and with external organizations. We also worked to reinforce our IT-based services, enhance safety and augment our competitiveness in the environmental field mainly through electrification in order to ensure a more accurate response to individual customers.

With regard to engines to be fitted in the 2021 models of some internal-combustion lift trucks sold in North America, we have not been able to obtain the country's legally mandated engine certification (as of June 30, 2021). Consequently, we suspended the shipment of these models (gasoline/LPG type) in January 2021 and their production in June 2021. We will work for early resolution of the issue and endeavor to receive certification by continuing to provide relevant information to the U.S. environmental authority.

In the logistics solutions field, we have been fostering cooperation in sales activities by mutually supplying equipment and systems while encouraging each TALG company to leverage its strengths to bolster business. We have also been accelerating coordinated activities as TALG such as promoting collaborative efforts in the planning and development fields. In April 2021, we established a new company, T-Hive B.V., in the Netherlands to develop a seamless control system for Toyota Industries' autonomous vehicles and systems, such as automated guided forklifts (AGF), automated guided vehicles (AGV) and autonomous mobile robots (AMR).

Meanwhile, Aichi Corporation, which possesses the top brand*3 in the field of aerial work platforms in Japan, made efforts to expand sales in the electricity and communications fields, while the market of special-purpose vehicles declined steeply due to restrained capital investment in the leasing industry. As a result, Aichi posted sales of ¥59.3 billion, up ¥0.9 billion, or 2%, over the previous fiscal year.


Aichi Corporation's aerial work platform

*3: Survey by Aichi Corporation

Activities of TMHG

Japanese Market

In 2020, while an expansion of the e-commerce market pushed up the demand for lift trucks, customers postponed their capital investment projects due to COVID-19, and the Japanese lift truck market declined overall. Unit sales of Toyota Industries' lift trucks were on par with the previous fiscal year at 45,000 units in fiscal 2021, but still maintained the top position*4 in calendar 2020 for the 55th consecutive year.

The diversification of customer needs, heightened on the back of an expansion of the e-commerce market, labor shortages and growing safety and environmental consciousness among companies, has further accelerated amid the COVID-19 pandemic. As the leading manufacturer of materials handling equipment, Toyota Industries has been proactively promoting the development and release of new products that lead to resolving issues facing customers.

As with the automobile industry, where development has been proceeding for cars equipped with advanced safety technologies, the logistics industry is facing a growing need for more widespread use of lift trucks equipped with functions to support safe operations. As a response, in April 2020 we added a safe operation assistance function, which had been available as an option, to our mainstay GENEO-series internal-combustion lift trucks and gene B-series electric lift trucks as a standard feature. Through a synergistic effect with the System of Active Safety (SAS)*5, a proprietary safety system fitted in our main lift truck models since 1998, we will further help reduce accidents caused by lift trucks.

Needs are also growing for the automation of materials handling equipment to increase the efficiency of logistics operations and make them contactless. In cooperation with All Nippon Airways Co., Ltd., we have carried out a test trial of our autonomous towing tractors to carry baggage at Kyushu-Saga International Airport. The test trial has been a first*6 in Japan to take place in actual airport operations.


Autonomous towing tractor

*4: Survey by Toyota Industries Corporation based on data published by Japan Industrial Vehicles Association

*5: A safety system that helps to prevent the overturning of a lift truck and load spilling. It includes a function to ensure stability while rotating (swing-lock control of rear wheels) and a function to automatically control the angle of the mast when lifting cargo high up (mast tilt control).

*6: This test trial of baggage transportation in actual airport operations was the first of its kind conducted in Japan after the application of the Japanese government's guidelines for autonomous operations within an airport.

North American Market

With a year-on-year decline in the North American lift truck market in 2020, Toyota Industries posted combined unit sales of the TOYOTA and RAYMOND brands of 80,000 units, down 13% from the previous fiscal year, but still remained the market share leader*7 in 2020. Meanwhile, parts sales and orders for after-sales services remained strong.

In 2020, Toyota celebrated 30 years of manufacturing in the United States, with cumulative total production surpassing 700,000 units. Along with enhancing the product offering with the release of new electric lift trucks and a high-capacity internal-combustion lift truck, Toyota proactively enhanced optional features that are based on ergonomics and serve to increase operability and reliability. In response to the growing need to automate intralogistics, Toyota launched AGFs fitted with the latest navigation system using Light Detection and Ranging (LiDAR) technology. Additionally, efforts related to the After Sales Service Evaluation and Certification (ASEC) program designed to increase the competitiveness of dealers and an initiative to improve operational efficiency in a systematic manner have proceeded steadily and produced positive results.


New AGF

Raymond has also been active in releasing new products and enhancing functionality to satisfy various customer needs. The product lineup has been enhanced with the release of an electric low lift truck with battery management functionality and an automated lift truck for intralogistics, which boasts improved telematics functionality and utilizes a vision-guided technology of a partner company. Raymond has also started sales of a battery management system using next-generation lithium-ion batteries that have shorter charging time and are more compact and highly functional than conventional lead-acid batteries. Paired with the iWAREHOUSE fleet management system, it will increase the productivity of logistics sites, optimize battery usage and simplify maintenance work, thereby allowing cost reductions throughout the lift truck lifecycle.

Next-generation lithium-ion battery

We have established a program to provide funding to university research projects with the aim of facilitating the development of next-generation technologies in the materials handling equipment industry. In 2020, we strengthened our collaboration with two universities for respective research projects.

We will continue to leverage the strengths of each brand and reinforce technological development by utilizing automation, telematics and other advanced technologies. In addition, through closer collaboration with the Logistics Solutions Business, we will accurately respond to customers' needs for greater logistics efficiencies.

*7: Survey by Crist Information & Research, LLC, 2020

European Market

Following the previous year, sales in the European lift truck market continued to decrease in 2020. Toyota Industries posted unit sales of 77,000 units in fiscal 2021, down 18% from the previous fiscal year. Conversely, orders for after-sales services and sales of parts remained steady.

In Europe, increases in logistics volume and small cargo delivery as well as a requirement for a shorter delivery time have pushed up the need for increasing the efficiency of logistics operations, mainly those of lift trucks, at distribution centers. As a response, Toyota Industries offers the I_Site fleet management system that connects more than 150,000 lift trucks to a network. Besides lift trucks' operational status, the system collects various information, such as data on impact detection and battery consumption. By analyzing the information and sharing the results with customers, the system not only achieves better lift truck operation and lower costs but also helps to increase safety awareness.

Notional image of Toyota I_Site

In terms of products, we are enhancing the lineup of models equipped with lithium-ion batteries. We are adding these models to low lift trucks and counterbalanced lift trucks in order to meet the diversifying needs of customers. Among internal-combustion lift trucks, a model fitted with our internally developed engine that satisfies the latest EU regulations is highly recognized in the market.

New electric low lift truck

Going forward, we will work to enhance the lineup of models offering excellent environmental performance. At the same time, to help customers achieve higher logistics efficiencies we will respond to the needs for connected and automated lift trucks, which are expected to grow further in the future, by utilizing the latest technologies.

ALOMA*8 and Chinese Markets

Toyota Industries covers the ALOMA markets of some 60 countries in Asia, Latin America, Oceania, the Middle East and Africa as well as the Chinese market. We are serving these markets with a lineup consisting of TOYOTA, BT, RAYMOND and Tailift brands.

The environment surrounding materials handling equipment in the ALOMA and Chinese markets underwent an unprecedented change in 2020. These markets temporarily turned downward from the previous year due to the rapid spread of COVID-19, but many ALOMA markets already began to recover in the latter half, showing a 96% year-on-year growth over the full term. Similarly, the Chinese market was quick to indicate a dramatic recovery and grew sharply by 137% over the previous year. The diversification of market needs has also accelerated further in the ALOMA and Chinese markets, as seen in strong environmental consciousness among more customers and a growing awareness of logistics costs. Against this backdrop, we have been making various efforts, such as initiating sales of Enelore, a new lithium-ion battery replaceable with lead-acid batteries used in our electrified lift trucks, releasing small electric hand pallet trucks in more countries and promoting the used lift truck business.

New Enelore lithium-ion battery

Jointly with dealers, Toyota Industries operates a program to promote sales activities with a focus on logistics improvement solutions and has been making proposals to visualize customers' logistics sites, improve their safety and reduce costs. Through the program, we have been strengthening our relationships of trust with customers and have successfully expanded our business domains.

In the field of after-sales services, we have established a structure to provide swifter and more efficient after-sales services by centrally and digitally managing information on lift trucks owned by customers and their history of repairs. We are putting in place a structure to offer extensive after-sales services by establishing a system to certify dealers' after-sales service facilities and offering programs to train service staff so that customers can use our products with an increased sense of reassurance.

As a total solutions partner capable of satisfying diverse logistics needs, we will make concerted efforts with dealers in each country to undertake various initiatives.

*8: ALOMA is a Toyota Industries term for Asia, Latin America, Oceania, Middle East and Africa.

Activities of TALG

Logistics System Engineering Department of Toyota Material Handling Japan

A sharp growth of the e-commerce market in recent years has increased inquiries and orders for large distribution centers. In response, we are striving to provide logistics solutions that cover the entire logistics process, encompassing the systems and equipment of Vanderlande and Bastian. Logistics automation, in particular, has drawn much attention since a need for contactless operations grew in step with the spread of COVID-19.

Automated lift truck operating in a freezer warehouse

In 2020, we put an automated lift truck to practical use in a freezer warehouse for the first time in Japan and launched a feasibility test jointly with Nichirei Logistics Group Inc. Additionally, we have conducted a feasibility test with TRUSCO Nakayama Corporation on the AiR-T autonomous intelligent mobile robot that assists picking operations in distribution centers. At the Aichi Robot Showcase, a project of Aichi Prefecture to promote the implementation of service robots in society, we made proposals on the use of the AiR-T in an office building and at a coffee shop.

AiR-T

In dealing with diversifying customer needs, we have taken a stake in +Automation Inc., a startup company providing a warehouse robotics system subscription service. Through this arrangement, we have been examining new sales methods and have reinforced the lineup of sorting robots used in distribution centers.

t-SORT sorting robot

Bastian

Bastian, mainly operating in the North American market, has been responding to the logistics automation needs of customers in a broad range of fields, including the manufacturing, retail and e-commerce sectors, and receiving an increasing number of orders.

Based on a wealth of know-how accumulated in past projects, Bastian has increased its capabilities for large system development and integration, thereby successfully receiving orders for a number of large projects in fiscal 2021.

Capitalizing on its strengths in software and other technology development, Bastian has been promoting collaboration with other companies in the Toyota Industries Group. For example, Bastian has received, jointly with Vanderlande, an order for a project of a leading e-commerce operator in North America and started to provide software programs to the Logistics System Engineering Department of TMHJ. In North America, Bastian has also been accelerating its offering of logistics solutions to lift truck users by reinforcing collaboration with dealers of the TOYOTA and RAYMOND brands.

System operating in an e-commerce distribution center

Vanderlande

Vanderlande, offering logistics solutions globally, has received many orders from leading companies in various business categories for their projects to establish distribution centers, capturing growing needs prompted by COVID-19 for more advanced logistics in the e-commerce, retail and parcel services sectors. For the warehouse logistics and parcel/postal services businesses, Vanderlande has been accelerating system development respectively optimized for operations of industry's top companies and focused business categories.

In the airport business, amid difficult operating conditions Vanderlande obtained orders for systems for new terminals from existing airport customers as well as long-term servicing contracts based on its long-standing relationships of trust.

High-speed sorting system used in the e-commerce and apparel sectors

Vanderlande is also promoting collaboration to further augment relationships with other companies within the Toyota Industries Group, working together with the Logistics System Engineering Department of TMHJ and Bastian to introduce its systems into the markets in Japan and North America, respectively.

Airport baggage handling system

Automobile

In the fields ranging from vehicle to engines, car air-conditioning compressors and electronics, Toyota Industries continues to meet the expectations and trust of its customers.

Link to product details

Business Characteristics

Strengths

- An agile structure to undertake all aspects from planning and development to production within a plant (Vehicle)
- Highest-level production efficiency and quality among all Toyota-affiliated automobile body manufacturers (Vehicle)
- Know-how on the development and production of diesel engines and turbochargers (Engine)
- Highly efficient production of high-quality gasoline engines, including those for use in hybrid electric vehicles (HEVs) (Engine)
- Excellent product development capability centered around fuel efficiency and car electrification (Car air-conditioning compressor)
- Global top-share*1 products for use in a full range of vehicles, from internal-combustion vehicles to HEVs, plug-in hybrid electric vehicles (PHEVs), battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) (Car air-conditioning compressor)
- *Monozukuri* (manufacturing) using equipment created in-house to produce high-quality products and flexibly accommodate changes in production volume (Car air-conditioning compressor)
- Higher technological capabilities accumulated through the development and production of products for Toyota Motor Corporation (TMC), external sales and internal use (Electronics)
- Development, production and top-level quality of electronic parts and devices for electrified vehicles (Electronics)

Opportunities

- Increasing needs for fuel-efficient products due to stricter environmental regulations and growing environmental consciousness
- Sales expansion in each sector in line with growth of the automobile market

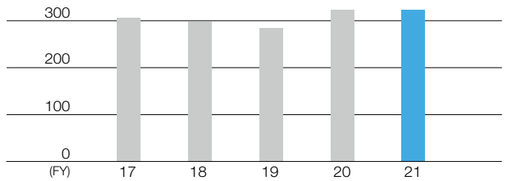
Risks

- Shrinking of the automobile market caused by economic slowdown
- Customers becoming less willing to buy fuel-efficient products following less stringent environmental regulations
- A drop in product competitiveness due to the yen's appreciation or a rise in raw material costs
- Suspension of production caused by supply chain disruptions

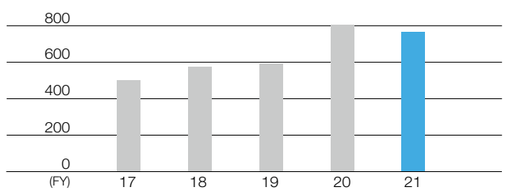
*1: Survey by Toyota Industries Corporation

Net Sales	Operating Profit
FY2020	FY2020
¥613.8 billion	¥17.2 billion
FY2021	FY2021
¥591.6 billion	¥4.7 billion

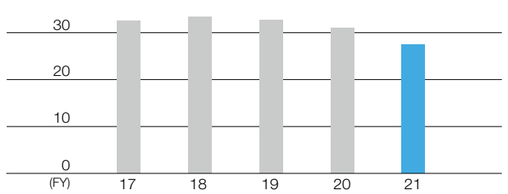
Vehicle Sales



Engine Sales



Compressor Sales






Vehicle

Medium-Term Direction of Business

We will contribute to TMC as a development and production base of compact sports utility vehicles (SUV) by leveraging our comprehensive strengths derived from the highest level of safety, environment, quality, cost and delivery (SEQCD) among all Toyota-affiliated automobile body manufacturers and through greater collaboration within the Toyota Industries Group.

Business Overview in Fiscal 2021

In fiscal 2021, sales of the RAV4 posted an increase in Japan, which was offset by a decline in sales elsewhere. As a result, unit sales remained on par with the previous fiscal year at 323,000 units. Net sales decreased by ¥1.6 billion, or 2% year on year, to ¥88.3 billion.

Nagakusa Plant to Initiate Production of a PHEV Model Added to the RAV4 Lineup

For the RAV4, which became the first Toyota vehicle in a decade to receive the Car of the Year Japan 2019-2020 award, a PHEV version was added to the lineup in June 2020, and Toyota Industries' Nagakusa Plant initiated production of the new model. The RAV4 PHV is equipped with a high-capacity, high-output lithium-ion battery, which achieves a driving range of 95 km in the EV mode. The model also realizes powerful acceleration and boasts greater fuel efficiency, thus offering superior environmental performance. Moreover, a system to feed power externally, useful during disasters and for outdoor activities, is a standard feature of the RAV4 PHV.

The Nagakusa Plant is the only plant in Japan to manufacture the RAV4 PHEV. As such, we will continue to help promote car electrification in the future.

RAV4 PHV

HARRIER Designed and Developed by Toyota Industries Selected as Good Design Best 100

The new HARRIER released by TMC in June 2020 was included in the 2020 Good Design Best 100 under the Good Design Award program, receiving high recognition for its exterior and interior designs that are both dynamic and sophisticated, bringing every detail together at a high quality level.

In addition to the design of the vehicle's upper body, Toyota Industries also developed its outer shape and interior.

In order to continue meeting customers' expectations, we will work to strengthen our vehicle planning and development capabilities and ensure quality.

HARRIER selected as Good Design Best 100

Presenting a RAV4 Concept Model at Tokyo Auto Salon 2021

We have been engaging in activities to turn the RAV4, for which Toyota Industries carries out from development to production, into an even more exciting and appealing SUV. As part of these activities, we presented the RAV4 5D*2-ADVENTURE at Tokyo Auto Salon 2021. It is a concept model exclusively created for mountain rescue operations based on a survey on professional-use vehicles running in a harsh environment. In order to reach a destination reliably and safely to start a rescue operation, the model is built from a professional viewpoint and incorporates various equipment and functions to enable driving in mountain areas under rough weather. We intend to utilize the outcome of these activities in future development of the RAV4.

*2: Features five action patterns ("dimensions") of rescue team members, enabled by the vehicle's unique equipment and functions.


RAV4 5D-ADVENTURE

Engine

Medium-Term Direction of Business

In line with the adoption of the Paris Agreement, an international framework to address climate change issues in 2020 and beyond as well as the announcement by some countries to accelerate efforts toward carbon neutrality, there is a growing demand for engines with even greater fuel efficiencies and cleaner emissions. Amid this environment, we aim to contribute to a reduction of CO_2 emissions by meticulously meeting customer needs for diverse engine systems and developing new, globally top-level technologies and products that also respond to car electrification.

Business Overview in Fiscal 2021
Unit sales in fiscal 2021 totaled 765,000 units, a decrease of 42,000 units, or 5%, from the previous fiscal year due to declines in sales of GD diesel engines and M20A gasoline engines. Thanks to an increase in sales of foundry parts, however, net sales increased by ¥1.4 billion, or 1% year on year, to ¥139.9 billion.

Engines for Automobiles

Diesel Engines

Needs for powertrains are becoming diverse depending on the region. The requirement is also growing mainly in emerging countries for diesel engines, which have high fuel efficiency and excellent torque at a low speed, as a power unit suited for SUVs and such commercial vehicles as pickup trucks. Toyota Industries' diesel engines are mounted in a variety of vehicles, including the Toyota Land Cruiser series, the world's renowned full-fledged four-wheel drive (4WD) model, and TMC's Innovative International Multipurpose Vehicle (IMV) series targeting emerging countries. Their high performance and reliability have gained strong market recognition. Currently, our mainstay products are in-line 4-cylinder GD diesel engines and V-type 8-cylinder VD diesel engines. The GD diesel engine is equipped with a turbocharger that provides significantly better performance through the adoption of new technologies, such as a ball bearing-type system.

As a global engine supplier, we will continue to undertake entire operation from development to production and supply diesel engines that can win the heart of customers worldwide.



High-output GD diesel engine and new turbocharger

Gasoline Engines

Our Toyota New Global Architecture (TNGA)*3 gasoline engines, namely the 2.5-liter A25A and 2.0-liter M20A, are mainly fitted in the RAV4 and HARRIER, which are achieving robust sales. Developed based on the TNGA concept, these engines offer both excellent driving performance and environmental performance. Responding to the advancement of car electrification, we have also added an HEV version of the A25A engine to our lineup.

In April 2021, we also started production of a turbocharger for gasoline engines mainly fitted in the Lexus RX and Crown. We are working to steadily increase the number of models equipped with this turbocharger. We will further improve the quality and productivity of our gasoline engines and turbochargers used in these engines and contribute to the creation of "ever-better cars" by TMC.

*3: Development policy and method for vehicle creation based on a modular platform


2.5-liter A25A engine for HEVs


Turbocharger for gasoline engines

Engines for Industrial Fields

Toyota Industries' engines are highly renowned for their reliability and excellent environmental performance in industrial fields as well. These engines are used for a wide variety of applications, including our lift trucks, and adopted by many manufacturers of GHPs*4, CHPs*5, generators and construction machinery. These engines offer downsized displacement compared with conventional models with equivalent output, resulting in higher fuel efficiency, cleaner emissions and a reduction in size.

*4: Short for gas heat pump; air conditioner driven by a gas engine
*5: Short for combined heat and power; co-generation system

Link to product details



Toyota 1ZS diesel engine and turbocharger

TOPIC

Participating in a Verification Test on Engines for River Drainage Pumps

In April 2021, Toyota Industries was selected as an engine manufacturer for a project to develop, introduce and utilize mass product drainage pumps, for which the Ministry of Land, Infrastructure, Transport and Tourism publicly solicited participants. The project aims to demonstrate a new system to operate river drainage pumps, which uses multiple diesel engines of mass-produced vehicles instead of a conventional, dedicated large diesel engine. Toyota Industries' 1GD diesel engine has been approved for the project.

Car Air-Conditioning Compressor

Medium-Term Direction of Business

In the Car Air-Conditioning Compressor Business, we leverage our core compression technology and have become an innovative component supplier amid an expected advancement in car electrification and autonomous technology.

We will further enhance our capability to develop products that offer excellent fuel efficiency, quieter operation, compactness and light weight. At the same time, with the aim of satisfying needs of a broader variety of customers, we will utilize our accumulated technologies to expand our development domain into core components for drive systems.

Business Overview in Fiscal 2021
In fiscal 2021, unit sales of car air-conditioning compressors decreased 3.52 million units, or 11%, from the previous fiscal year to 27.51 million units due mainly to lower sales in North America and Europe. Net sales were down ¥26.6 billion, or 8%, from the previous fiscal year to ¥301.6 billion.

Development Efforts Centered around Fuel Efficiency and Car Electrification

Even though growth in the car air-conditioning compressor market is currently slowing down due to the stagnating automobile market, we expect continued growth over the medium term on the back of expanding automobile sales and an increase in the number of vehicles fitted with an air conditioner. Unit sales of electrified vehicles, in particular, are expected to grow significantly for the foreseeable future as automakers aggressively roll out new models to accommodate stricter fuel efficiency regulations in respective countries and expanding customer needs. Amid this environment, we will further reinforce product development for not only compressors for internal-combustion vehicles, which are still mainstay products as of now, but also compressors for electrified vehicles, for which we anticipate stronger demand.

More Compressors with High Fuel Efficiency to Receive Off-Cycle Credits

More stringent fuel efficiency standards have been enforced across the world, pushing the need for higher fuel efficiency both for internal-combustion vehicles and electrified vehicles. In the United States, our SES series for internal-combustion vehicles became the industry's first compressor to be approved under the country's off-cycle credits program. The program gives off-cycle credits to technologies that can effectively improve fuel efficiency. Since receiving the first*6 accreditation, we have acquired credits for our compressors for electrified vehicles as well, and the number of models equipped with these compressors has been growing.

Strengths of Toyota Industries' Electric Compressors

CSR Material Issue

Since launching the world's first*6 mass production of electric compressors in 2003, our products have been used in HEVs, PHEVs, BEVs and FCEVs of Toyota, Ford, Daimler, Honda, Nissan and other automobile brands. We have been undertaking efforts to further increase the appeal of these compressors based on our technology and know-how accumulated through the development of a broad range of models. Among various electrified vehicles, BEVs in particular are facing the growing need for higher electric efficiency while a heater is turned on as well as for cooling heat-emitting key components, such as batteries. In response, we have been developing and manufacturing high-capacity types by leveraging our strengths represented by high efficiency and reliability.

In addition to enhancing product appeal, we plan to further reinforce our capability to support automakers, for example, by proposing solutions to issues related to an automobile as a whole, and ultimately expand sales.

*6: Survey by Toyota Industries Corporation

	Our Strengths in Electric Type	Our Initiatives
Common to all electric compressors	Broad product lineup	**Applicable to a variety of vehicle models** from compact to luxury cars
	Higher efficiency in power consumption / Lower noise / Less vibration	**Design with our patented technology while ensuring product quality and performance in mass production** by leveraging precise machining/assembly technology
	Support capability to automakers	Proposal of problem **solutions to automakers**
Electric compressors for BEVs	Prevention of radio disturbance on home electrical appliances while charging BEVs	Improvement of inverter performance **achieving lower electromagnetic noise**
	Improving electric efficiency while a heater is turned on	Development of **high-efficiency** compressors for **heat pump air conditioning system**
	Cooling such devices as batteries	Expanding our business field to **driving components** with **reliability**

Utilizing Compression Technology to Extend Our Role into the Field of Core Components for Drive Systems

CSR Material Issue

Going a step beyond the cooling functionality of car air-conditioning compressors, we have utilized our compression technology accumulated to date to develop and manufacture air compressors, which take in and compress air to efficiently supply the oxygen necessary to generate power, as well as hydrogen circulation pumps. We aim to play a role in realizing a hydrogen-based society by contributing to an improvement in the performance of FCEVs through the development of these components.

TOPIC

The new MIRAI FCEV released by TMC in December 2020 uses an air compressor and hydrogen circulation pump newly developed by Toyota Industries. The air compressor is the world's first*7 mass-produced product to adopt a centrifugal method using a movable roller-type traction drive unit. Not only does the product achieve a 24% compression efficiency improvement, 35% weight reduction and 45% size reduction compared with the previous model but it also contributes to the higher output of the new MIRAI. The hydrogen circulation pump adopted a new seal structure that offers better corrosion resistance. This makes it possible to change the material used for the pump from stainless steel to aluminum, thereby realizing a 41% weight reduction.

*7: Survey by Toyota Industries Corporation

Oxygen-supplying air compressor

Hydrogen circulation pump

Production-Related Strengths Underpinning Quality and Performance

High-precision machining and assembly technologies are essential in realizing high quality and the superior performance of products. Toyota Industries realizes high-speed and high-precision machining by leveraging its know-how accumulated through responding to the stringent demands of automakers worldwide and by developing devices from processing machines to associated cutting tools in-house.

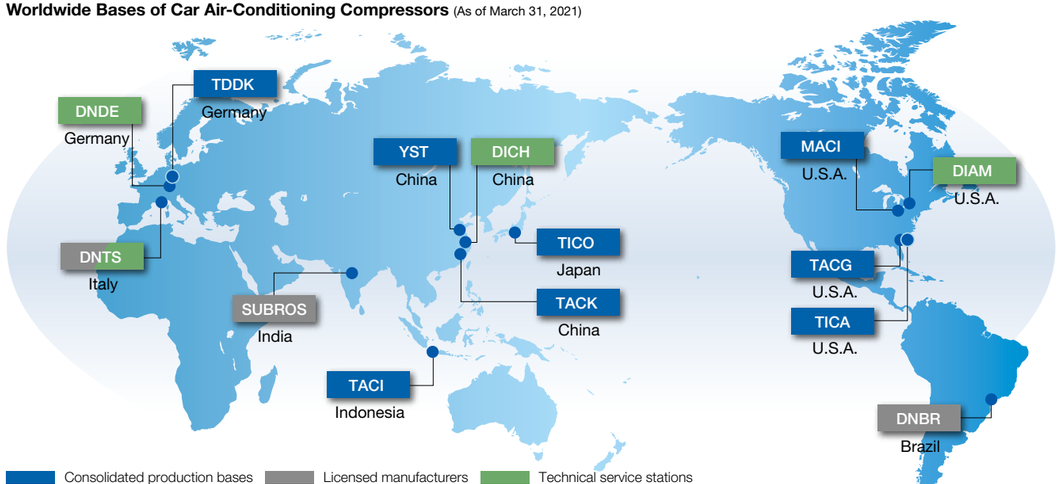
Establishing Stronger Global Production and Supply Structures

In step with the move toward more stringent fuel efficiency regulations and car electrification, the car air-conditioning compressor market is expected to witness fluctuations in demand for compressors both for internal-combustion vehicles and electrified vehicles. In response, we are building a production structure less vulnerable to changes in production volume through such measures as automating our plants to save labor, designing mixed lines that enable the production of a wide variety of products and creating a framework to increase production capacities in a phased manner.

Meanwhile, we expect the rapid spread of electrified vehicles in China driven by the country's new energy vehicles (NEV) regulation*8. Accordingly, we will make sure to capture booming demand by promoting the local production of electric compressors. We have already initiated local production at TD Automotive Compressor Kunshan Co., Ltd. (TACK) in March 2020 and at Yantai Shougang TD Automotive Compressor Co., Ltd. (YST) in June 2021.

*8: Regulation in China mandating automakers to produce a certain percentage of BEVs and other new energy vehicles

Worldwide Bases of Car Air-Conditioning Compressors (As of March 31, 2021)



Toyota Industries' car air-conditioning compressors are widely adopted by automakers around the world, garnering the No. 1*9 position in global sales.

*9: Survey by Toyota Industries Corporation

Electronics

Medium-Term Direction of Business

Car electrification is steadily progressing in keeping with the enforcement of more stringent environmental regulations and growing energy-saving consciousness among customers. The Electronics Division will contribute to car electrification in a broad range of fields, from offering on-board power source devices to improving social infrastructure through the provision of charging stands and systems to feed electricity externally.

Business Overview in Fiscal 2021

Net sales of electronics products expanded, primarily supported by sales of on-board chargers for PHEVs and BEVs.

Contributing to Car Electrification

Toyota Industries develops and manufactures on-board power source devices, including DC-DC converters, on-board chargers and AC inverters, and charging stands. We sell these products mainly to TMC and other automakers across the world.

A DC-DC converter converts the high voltage of on-board batteries into a lower voltage level to supply power to standard electrical devices such as lights and wipers. Our DC-DC converters are fitted in the Prius, Aqua and other major electrified vehicles. By utilizing such technologies as the world's first thick copper substrate*10, we have reduced the product volume and weight.

An on-board charger converts AC voltage from the power grid into DC voltage in vehicles and is necessary for charging PHEVs and BEVs, for which the market is expected to expand in the future. We offer chargers compatible with a wide range of voltages to enable their use in various parts of the world.

DC-DC converter

On-board charger

In addition, we have been contributing to car electrification also in terms of infrastructure by developing public charging stands for PHEVs and BEVs.

*10: Survey by Toyota Industries Corporation

Charging stand for PHEVs and BEVs

Helping to Increase the Competitiveness of Our Electrified Products

We will leverage our technology and know-how cultivated in the development of vehicle power source devices to engage in the development of electronic components in other businesses as well, such as materials handling equipment and textile machinery, and to increase the appeal of our products. Through these efforts, we intend to spur greater synergistic effects among our businesses in moving ahead with electrification.

Use of an Electrified Vehicle as a Power Source during a Disaster

CSR Material Issue

In recent years, there has been a growing public attention to the use of high-capacity batteries of electrified vehicles as a power source. The 1.5-kW type AC inverter, in particular, can operate appliances that require more power, such as rice cookers and hot plates, and has drawn much attention as an emergency power source in a disaster in addition to camping, outdoor events and other applications.

In July 2020, we conducted a disaster prevention drill using the power source functionality of an AC inverter, which is fitted in the RAV4 PHV manufactured at the Nagakusa Plant. During the drill, we used the AC inverter to power multiple electric appliances simultaneously, such as a radio, TV, notebook PC, smartphone charger, lighting device, electric fan, refrigerator, heater and hot-water pot, and verified its usefulness as a power source.

Disaster prevention drill using AC inverter's power source functionality

Textile Machinery

Carrying on the philosophy of founder Sakichi Toyoda, which reflects his strong commitment to manufacturing, Toyota Industries responds to a broad range of needs with its extensive product lineup, from air-jet looms, for which we enjoy the world-leading market share* in unit sales, to ring spinning frames and roving frames.

Link to product details

* Survey by Toyota Industries Corporation

Business Characteristics

Strengths

- Broad product lineup both in the spinning and weaving machinery fields
- World-leading market share* in unit sales of air-jet looms
- Global, well-developed service network
- Ability to develop products that excel in reliability, energy-saving performance and versatility

Opportunities

- A rise in textile demand in line with an increase in the world population
- Further increasing applications in industrial textile products
- Increasing need for high-quality and highly functional yarn and textile products, following the economic growth of emerging countries

Risks

- Changes in each government's policies concerning promotion of the country's textile industry
- Weaker sales due to intensifying competition
- A decline in capital investment due to economic slowdown and raw cotton and/or yarn price fluctuations

Medium-Term Direction of Business

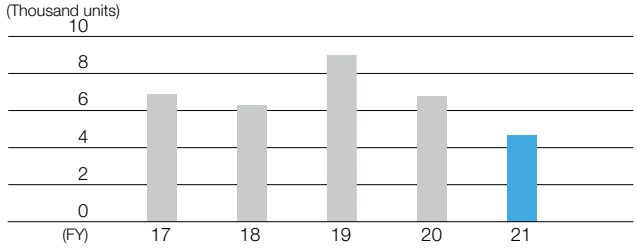
With growing environmental consciousness worldwide, needs are expected to increase further for textile machinery offering superior environmental performance. Toyota Industries' products are highly acclaimed by customers for their excellent reliability and productivity as well as energy-saving performance. We will continue to develop energy-saving and other innovative technologies and seek to achieve further growth and evolution as a leading manufacturer of textile machinery.

Business Overview in Fiscal 2021

On the whole, the environment surrounding the textile machinery market continued to be difficult. Unit sales of air-jet looms decreased 2,100 units, or 31% year on year, to 4,700 units. Combined with a decrease in sales of quality measurement instruments for fiber, yarn and fabric, net sales were down ¥20.9 billion, or 34%, from the previous fiscal year to ¥40.8 billion.

Net Sales		Operating Profit	
FY2020		FY2020	
¥61.7 billion		¥2.9 billion	
FY2021		FY2021	
¥**40.8** billion		(¥**1.1** billion)	

Air-Jet Loom Sales



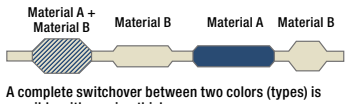
Growing Needs for Air-Jet Looms

Toyota Industries' air-jet looms are adopted by customers in China, India and many other countries. Produced fabrics are used broadly for towels, shirts and other clothing purposes as well as in industrial products such as vehicle airbags. Recently, the need has been on the rise for fabrics such as woven glass fiber for use in smartphone substrates, and it is anticipated that applications for air-jet looms will expand further.

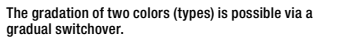
MOSAIC Yarn Spinning Device Receiving an Award at the National Commendation for Invention

Our MOSAIC yarn spinning device, offered as an option to the RX300 high-speed ring spinning frame, received the Minister of Economy, Trade and Industry Award at the 2020 National Commendation for Invention. The award recognized the device's ability to flexibly change the mixing ratio of two different types of roving materials in one yarn and to completely switch over between the two types, such as by chopping and reconnecting the roving materials. The resulting MOSAIC yarns enable unconventional, diverse fabric designs, helping to create a new market in the textile industry, mainly in the apparel field.

Yarn made using the MOSAIC yarn spinning device

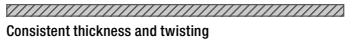


A complete switchover between two colors (types) is possible with varying thickness.



The gradation of two colors (types) is possible via a gradual switchover.

<Reference: Normal yarn>



Consistent thickness and twisting

Product sample made with MOSAIC yarn