The Value Creation Story of Isuzu

The Value Creation Story of Isuzu

By spurring innovation through the development of next-generation products that help facilitate carbon neutrality and of new products geared toward evolving logistics, the Isuzu Group will create new value for its customers and for society as a whole going forward.

Sources of Competitiveness Underpinning Value Creation

Page 16

- Development capabilities
- Production capabilities
- Sales and service capabilities
- Human resources
- Financial base
- Environmental responsiveness

Isuzu's Value Creation Process

ISUZU

Understanding customer needs and planning next-generation products

Thoroughly establishing product quality from the customer's perspective

Leveraging manufacturing technologies and on-site capabilities that underpin the production of a wide variety of products in small lots

Global customer base

Business partners

Providing after-sales support to maximize vehicle operation

Providing products to our customers around the world

Spurring innovation

- Promoting next-generation product development to help facilitate carbon neutrality
- Promoting new product development geared toward evolving logistics

The Value Isuzu Aims to Provide

Vehicle and Product Lineup

Page 11

Social Value

Realizing a society in which people and goods can be transported securely, safely, and efficiently

Balancing the global environment and economic development

Enhancing lifestyles and economic growth in emerging countries

Sustaining lifestyles and the environment in emergency situations

Economic Value

Fiscal year ended March 31, 2022 (results)

Net sales
¥2,514.3 billion

ROE
11.4%

Operating income
¥187.2 billion

Dividends
¥51.3 billion
(interim + year-end dividend total)

Corporate vision

Isuzu will always mean the best: a leader in transportation, commercial vehicles, and diesel engines, supporting its customers and respecting the environment.

The Value Creation Story of Isuzu

The Kind of Value We Aim to Provide

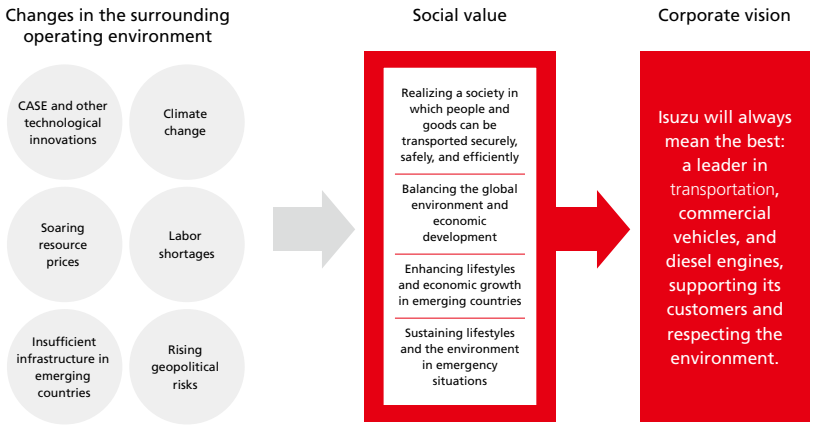
1 Activities to realize the value we aim to offer society

We have established "realizing a society in which people and goods can be transported safely, securely, and efficiently," "balancing the global environment and economic development," "enhancing lifestyles and economic growth in emerging countries," and "sustaining lifestyles and the environment in emergency situations" as the four themes through which we aim to provide value to society.

We believe that realizing a society in which people and goods can be transported steadily and efficiently, no matter what the environment, will lead to prosperous lifestyles for people in the future. To date, we have supported the transportation of people and goods around the world by creating a logistics infrastructure that can deliver necessary cargo to the places that need it, even in the event of a natural disaster or other unpredictable circumstances, much in the same manner as water and electricity.

Meanwhile, the operating environment that surrounds the Company is undergoing dramatic change in light of recent technological innovations such as connected, autonomous, shared & service, and electric (CASE) and the trend of strengthening measures to respond to climate change. Emerging countries lack the necessary infrastructure to respond to rapid industrialization and population increases. As a result, various transportation and environmental issues are emerging, and there is a need to improve people's standard of living. Additionally, advanced countries are facing issues such as truck driver shortages in the logistics industry and a massive increase in transportation volumes due to rising demand for e-commerce. This has led to a situation in which goods cannot be delivered in a timely fashion.

We are working to resolve these difficult issues by offering not only trucks, buses, and pickup trucks but also products that provide motor power sources for these vehicles and relevant other services, thereby establishing a robust social infrastructure. At the same time, we are striving to realize our corporate vision of "Isuzu will always mean the best: a leader in transportation, commercial vehicles, and diesel engines, supporting its customers and respecting the environment."



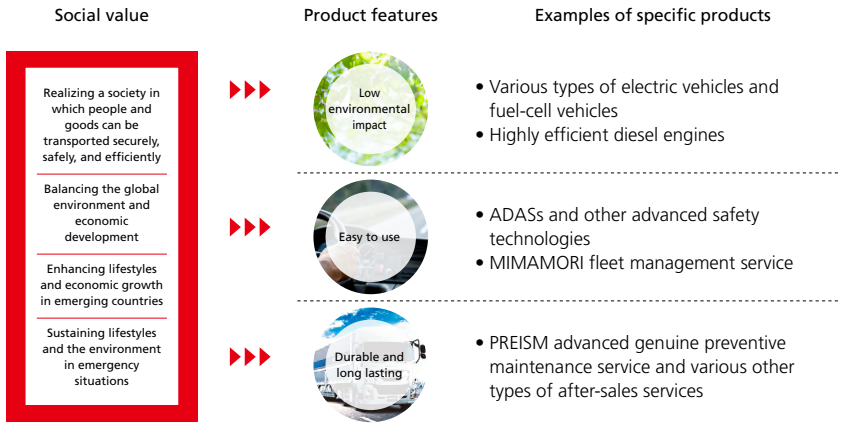
2 Activities to ensure necessary product value

We have determined three kinds of value that our products need to have so as to provide social value based on the four aforementioned themes.

The first kind of value is "low-environmental-impact" products. In order to address global issues such as climate change, our products need to have a low environmental impact. To date, we have delivered highly efficient internal combustion engine vehicles and other products to customers across the globe. Going forward, we will further enhance the value of our products through the development of innovative technologies such as electrification and strive to create products with a low environmental impact.

The second kind of value is "easy-to-use" products. Commercial vehicles are an indispensable tool for delivering social value to realize a society in which people and goods can be transported safely, securely, and efficiently. We have thus far provided products that make use of advanced safety technologies such as advanced driver-assistance systems (ADASs), and products with high fuel efficiency. In addition, through fleet management services such as MIMAMORI, we have offered services that enable customers to utilize commercial vehicles safely and securely, as well as in an economically rational manner. Going forward, we will continue to provide safe, easy-to-use products in collaboration with our business partners and customers.

The third kind of value is "durable and long-lasting" products. We have worked to provide highly reliable and durable commercial vehicles while offering services to support their stable operation, such as after-sales service networks and PREISM. Through the ongoing provision of products that allow for sustainable production activities, we will further support the stable economic growth of regional economies.



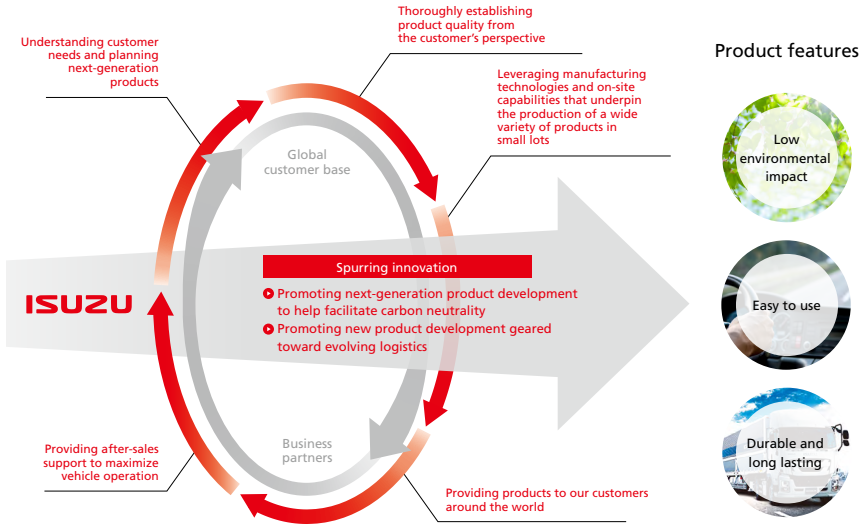
The Value Creation Story of Isuzu

How Isuzu Creates Value

3 Innovation activities to create new product value

Within the five business processes of "understanding customer needs and planning next-generation products," "thoroughly establishing product quality from the customer's perspective," "leveraging manufacturing technologies and on-site capabilities that underpin the production of a wide variety of products in small lots," "providing products to our customers around the world," and "providing after-sales support to maximize vehicle operation," we have sought to achieve differentiation and high levels of sophistication while drawing on the strengths of the Isuzu Group to their full potential. We will take steps to leverage the strengths we possess in our existing businesses to steadily execute each of these five processes and also work to further enhance the overall sophistication thereof. Doing so will help us create the three kinds of value that our products need to deliver.

Meanwhile, we have come to understand that the dramatic changes that have occurred recently in social environments have made it difficult to meet customer needs for "low-environmental-impact" and "easy-to-use" products through our conventional business processes alone. For that reason, we will strive to become a corporate group that spurs innovation by embracing diverse perspectives and creating frameworks for enhancing the diversity of our human resources while ensuring they have an active role. Also, we will collaborate appropriately with a broad range of partner companies (co-creation activities and business alliances) to address the social issues of "promoting next-generation vehicle development to help facilitate carbon neutrality" and "promoting new product development geared toward evolving logistics" over the medium to long term. By doing so, we will accelerate the pace of our value creation.

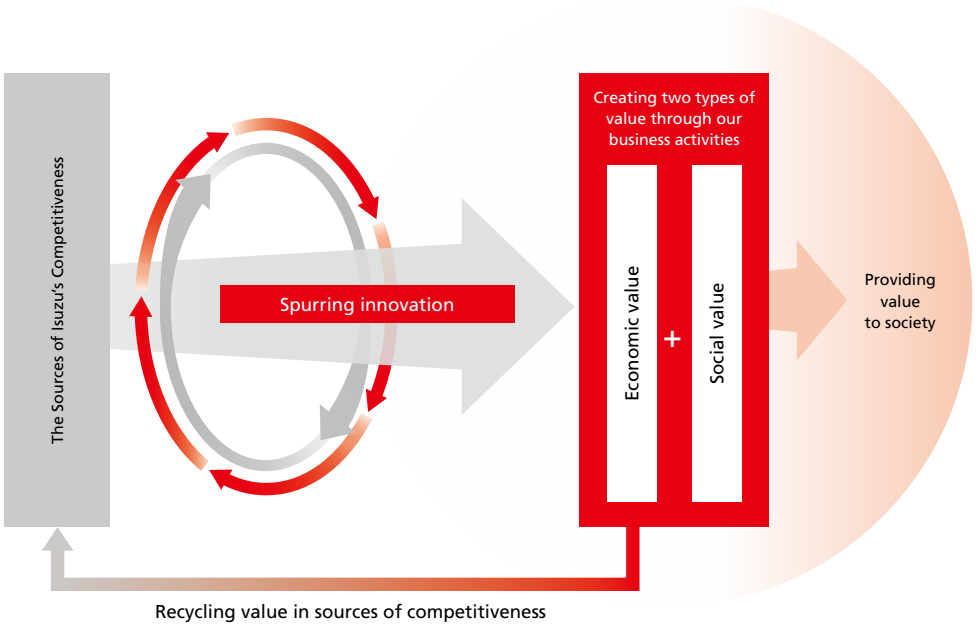


4 Sustainable development of the Company and society at large

Through these three activities, we will contribute to the realization of a prosperous and sustainable society.

With that said, it is imperative that we as a company realize sustainable growth if we are to continue to pursue these activities. Through the aforementioned innovation activities and the creation of product value, we will enhance the economic value we offer as a company. We will also utilize this economic value as capital for further reinforcing our current sources of competitiveness. Furthermore, we will draw on these reinforced sources of competitiveness to boost the competitive advantage of our products and services, thereby creating new value for society.

In these ways, we will push forward with activities that mutually enhance and benefit society and the Company, with the aim of establishing an indispensable social presence.



Sources of Competitiveness Underpinning Value Creation

The sources of our competitiveness, built up through the growth we have thus far achieved, underpin our current business activities and will help us enhance corporate value in the future. Going forward, we will strive to reinforce these sources so that we can continue to achieve sustainable growth.

Development Capabilities

Development capabilities that realize innovations and optimal structures for alliances in each business and in technological domains

Development bases

Establishment of development bases starting with three locations in Japan and spanning ASEAN, Europe, the United States, and China

Research and development expenditures

¥104.8 billion

Plan for ¥340.0 billion in research and development expenditures over the three-year period of Medium-Term Business Plan 2024

Production Capabilities

Isuzu's high-quality *monozukuri* (manufacturing) that responds to diverse customer needs

Production bases

43 bases in **30** countries

Capital expenditures

¥78.4 billion

Plan for ¥300.0 billion in capital expenditures over the three-year period of Medium-Term Business Plan 2024

Sales and Service Capabilities

Brand power and trust-based relationships with customers cultivated through high-quality products and services

Countries and regions in which Isuzu has No. 1 market share

37 countries and regions*1

Countries and regions in which Isuzu conducts sales activities

More than **150** countries and regions

Service networks

- Japan: **252** locations
- Overseas: **3,560** locations

Human Resources

Diverse human resources on a global scale

Total number of employees

- Non-consolidated: **8,056**
- Domestic consolidated subsidiaries: **20,671**
- Overseas consolidated subsidiaries: **15,572**

Hours of training programs by rank

231,993 hours*2

(29 hours per person)

Financial Base

Solid business foundation

Shareholders' equity

¥1,194.1 billion

Interest-bearing debt

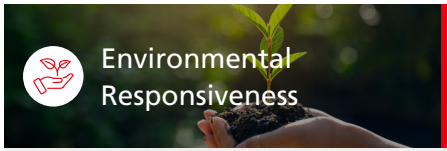
¥530.5 billion

Return on equity

41.8%

Issuer credit ratings

- A (R&I)
- A+ (JCR)



Environmental Responsiveness

Business operations with low environmental impact

CDP

- Climate Change A– rating
- Selection for the Supplier Engagement Leadership Board

Environmental management

- Promotion of overall business management based on ISO 14001
- Independent audit of environmental data
- Achievement of net-zero emissions

Note: The numerical and other data on this page is for the year ended March 31, 2022, or as of March 31, 2022. *1 CY2021 results (January 2021 - December 2021) *2 Total hours of participants

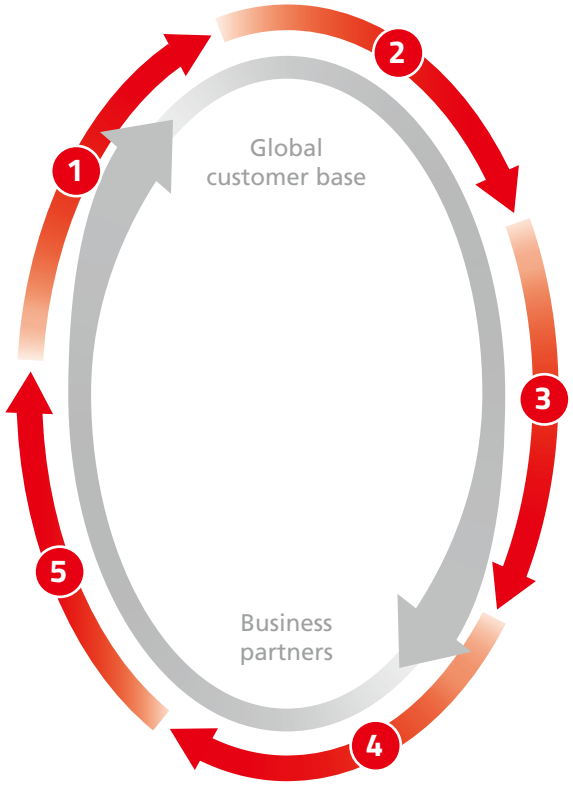
Isuzu's Value Chains

Commercial vehicles are used by a broad array of customers, including logistics companies, retailers, and construction companies. Such vehicles are also utilized for various purposes, which include long-distance and high-occupancy operations.

Therefore, various types of vehicles are required depending on the size and weight of the payload and rear body as well as the distance goods need to be transported. Since each country around the world has different laws, regulations, and traffic conditions, it is necessary to develop vehicles that meet these requirements.

It is also very important to keep these working vehicles operational at all times in order to transport goods in a timely and appropriate manner, and the development of our services is required to achieve this. With its unique track record in commercial vehicles as a foundation, the Isuzu Group will strive to create new value for society and customers and further enhance its corporate value through all activities conducted under the Group's business process.

This page provides an overview of Isuzu's value chains, and the subsequent pages provide details on specific initiatives.



1 Understanding customer needs and planning next-generation products

P.18

- Planning for products that can be used for 10 or 20 years
- Establishment of a specialized department to work with customers to resolve issues and expand market-oriented product development
- Utilization of know-how to reflect information on market needs obtained from customer bases in each country and region in which we operate in the planning of next-generation products

By leveraging these strengths, we will continue to provide vehicles and services that meet customer expectations in the future.

2 Thoroughly establishing product quality from the customer's perspective

P.19

- Extensive understanding of how a wide variety of commercial vehicles are used
- Incorporation of quality needs into manufacturing processes, such as quality management activities and development processes, to create quality, user-friendly products

We will strive to achieve a higher level of quality and further improve our product capabilities through continuous quality improvements from the product development phase to the after-sales phase.

3 Leveraging manufacturing technologies and on-site capabilities that underpin the production of a wide variety of products in small lots

P.20

- Vehicle manufacturing technology capable of efficiently producing a wide variety of vehicle models, even in small lots
- Manufacturing technology and know-how that are deployed at Company plants around the world
- Implementation of production technology improvement activities and human resources development at each plant

We will carry out production technology improvement activities and human resource development at each plant.

4 Providing products to our customers around the world

P.21

- Building of a network to deliver products to more than 150 countries and regions
- Development and distribution of pickup trucks and light-duty trucks to meet the needs of emerging countries that require durable and reliable vehicles

By continuing to contribute to the construction of logistics infrastructure, we will support the economic development of emerging countries and the rest of the world.

5 Providing after-sales support to maximize vehicle operation

P.21

- MIMAMORI: launched in 2004, enables the monitoring of vehicle conditions and currently provides information on vehicle anomaly detection
- PREISM: provides services to minimize vehicle inspection and maintenance servicing times by utilizing acquired vehicle information

We will further advance these services to maximize the operating times of our customers' vehicles.

Particularly relevant sources of competitiveness: Development capabilities | Production capabilities | Sales and service capabilities | Human resources | Financial base | Environmental responsiveness

Isuzu's Value Chains

1 Understanding Customer Needs and Planning Next-Generation Products

In many cases, commercial vehicles are used longer than passenger vehicles, so it is essential for us to plan next-generation products that meet the needs of customers 10 or 20 years into the future. For this purpose, in April 2019 the Company established a specialized department to work with customers to resolve issues and created a system for market-oriented product development.

We will continue to provide vehicles and services that meet our customers' future expectations, leveraging our customer base, insight regarding market needs obtained via our worldwide sales network, and the know-how to appropriately apply this insight to the planning of next-generation products.

Topic 1

Co-creation activities with customers

The Isuzu Group's customer base is one of its major business assets.

Through co-creation activities with a wide range of customers, we will continue to develop new vehicles and services that are closely tailored to the usage scenarios of individual customers.

In April 2019, the Company established a department dedicated to working with customers to resolve issues and created a system for market-oriented product development. Such efforts as those mentioned above allow us to not only collaborate with customers but also work closely with our product development and sales divisions to accelerate the resolution of customer issues.

For example, in the case of retail clients, we thoroughly investigate and identify issues along the life cycles of products, from ordering to loading onto trucks, delivery, and putting on display. Doing so enables us to propose solutions that are based on a deep understanding of customers' issues.

The Company will continue to increase its collaborative business partnerships and strive to carry out *monozukuri* (manufacturing) from a customer-oriented perspective.

Topic 2

Example of co-creation activity related to public transportation

Isuzu, in collaboration with Nishi-Nippon Railroad Co., Ltd. and Mitsubishi Corporation, conducted demonstration tests using the Company's large demonstration test vehicle for realizing autonomous driving, one of the solutions expected to alleviate the driver shortage in public transportation.

The demonstration tests first targeted the attainment of Level 2 autonomous driving* in a limited driving area, after which the use of autonomous driving technology was gradually increased with the aim of realizing Level 4 autonomous driving* in the future. With the cooperation of Fukuoka International Airport Co., Ltd.—which aims to introduce autonomous driving technology in order to facilitate the smooth transportation of passengers and luggage between the Fukuoka Airport domestic and international passenger terminal buildings—such demonstration tests were conducted for one month from March 2022 in a closed space along the connecting bus route between the two terminals.

Through these demonstration tests, we identified issues related to operations and services. While advancing autonomous driving technology for buses, we will continue to study ways to realize the future social implementation of autonomous technology, in addition to resolving such social issues as labor shortages due to the declining birth rate and aging population of Japan.

* The level of autonomous driving conforms to the Society of Automotive Engineers (SAE) 6 Levels of Driving Automation™, or SAE J3016, the international standard in this regard. Level 2 autonomous driving refers to partial driving automation in which the system partially performs both accelerator and brake control operations and steering wheel operations. Level 4 autonomous driving refers to advanced driving automation in which the system performs full driving operations including cognition, judgment, and operation in specific driving conditions.

Demonstration test vehicle

Isuzu's Value Chains

1 Understanding Customer Needs and Planning Next-Generation Products

Topic 3

Example of co-creation activity at manufacturing sites

The aforementioned driver shortage impacts not only logistics but also the sustainability of manufacturing sites. In particular, blast furnaces at steelworks are expected to operate 24 hours a day, 365 days a year, as are transportation and other related operations. Therefore, there is concern that the driver shortage will have an impact on said operations.

To address this issue, UD Trucks Corporation, an Isuzu Group company, will conduct a demonstration test from the second half of fiscal 2023, using a heavy-duty truck equipped with Level 4 automatic driving technology at the Kakogawa Steel Works of Kobe Steel, Ltd.

Based on the results of these demonstration tests, both companies will continue to explore the creation and practical application of solutions that utilize automated driving technology. In addition, we aim to implement autonomous driving technology in the logistics and manufacturing industries of the future while working to solve various social issues including labor shortages due to the low birth rate and aging population of Japan.

2 Thoroughly Establishing Product Quality from the Customer's Perspective

At Isuzu, we understand how our customers use our products and incorporate their need for quality into our quality management activities, product development processes, and other *monozukuri* (manufacturing) processes. By doing so, we create quality products that our customers can use easily.

Through these activities, we will strive to make products that can be used safely and securely by customers in any environment. The Isuzu Group will continuously improve product quality from the development phase to the after-sales phase to further improve product capabilities.

Topic

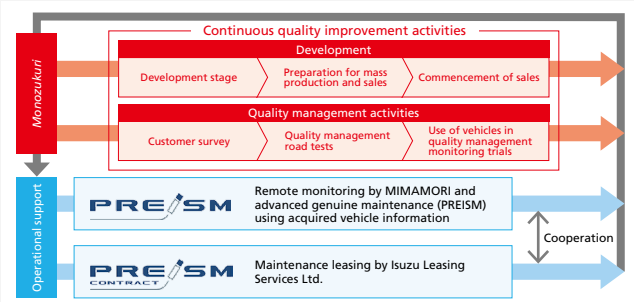
Thoroughly establishing product quality from the customer's perspective

The Isuzu Group's *monozukuri* (manufacturing) activities consist of two pillars: the development of optimal vehicles that customers can use with peace of mind and quality management activities that continuously maintain and improve the quality of vehicles after they are sold.

UD Trucks, which joined the Group last fiscal year, is also promoting the activities mentioned above.

In the product development process, stage gates are established at each phase, from the planning stage to the development, mass production, sales preparation, and market evaluation stages, and product development is carried out while conducting quality checks in a timely manner. Additionally, we are striving to improve quality by incorporating methods such as failure mode and effect analysis (FMEA)*1 and quality function deployment (QFD).*2

Overview of *Monozukuri* (Manufacturing) from the Customer's Perspective



Customer surveys	Test driving	Monitoring of vehicle activities
Acquire and analyze data such as engine and transmission data during driving in order to improve performance and quality	Based on the data obtained from customer surveys, reflect findings in test vehicles and reconfirm said findings by test driving on actual roads in Japan and overseas	Request customers to use the vehicle enhanced through the above steps and conduct long-term monitoring. Feedback and requests then collected through data anomaly checks and customer visits carried out by the Development Division

The purposes of quality management activities are to provide customers with safe and secure vehicles and to strengthen product capabilities through continuous quality improvements from the development stage to the after-sales stage. These activities are conducted in the previously described three steps, and they will be leveraged to enhance product competitiveness and develop next-generation models.

Remote monitoring by MIMAMORI and advanced genuine maintenance (PREISM) using acquired vehicle information have reduced breakdowns and maintenance times. In addition, the acquired information is fed back to the Development Division, leading to *monozukuri* (manufacturing) activities that are implemented from the customer's perspective.

*1 Approach aimed at identifying problems that arise during use at the design phase
*2 Method to ensure quality assurance from the development phase of new products

Isuzu's Value Chains

3 Leveraging Manufacturing Technologies and On-Site Capabilities That Underpin the Production of a Wide Variety of Products in Small Lots

Isuzu's strength lies in its vehicle manufacturing technologies, which enable efficient production of a wide variety of models, even in small lots.

Furthermore, based on a unified approach to *monozukuri* (manufacturing) and quality control at all of our plants around the world, we have been deploying these vehicle manufacturing technologies and attendant expertise at said plants and leveraging such technologies and expertise in our improvement activities and human resource development.

In order to incorporate design that takes a customer-oriented perspective, the Company will meticulously create products while visualizing the real-life scenarios in which customers will actually use them.

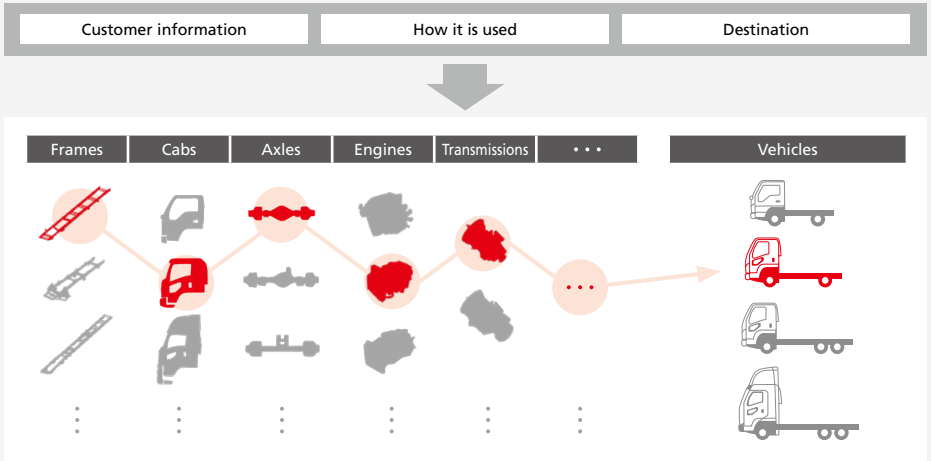
Topic 1

A characteristic of commercial vehicle operations: high-mix, small-lot production

Isuzu manufactures more than 2,500 types of commercial vehicles with different combinations of frames, cabs, axles, engines, and transmissions.

Of the more than 2,500 types of commercial vehicles produced each year, only 5% are manufactured in quantities of over 1,000. With the aim of maintaining high-mix, small-lot production, we are constantly making improvements to ensure efficient production.

Further, to be able to manufacture any type of vehicle on a limited production line, the Company is developing innovative production line designs, increasing the number of multi-skilled workers on-site, and improving the efficiency of on-site tasks.



Manufacturing technologies that can facilitate high-mix, small-lot production of more than 2,500 combinations are necessary.

Topic 2

Realizing a high level of unified *monozukuri* (manufacturing)

One of the principles of the Company's *monozukuri* is to manufacture all products that bear the Isuzu name through the same approach to *monozukuri* and quality control at all of its plants, anywhere in the world. To this end, we believe it is important to extend the know-how we have cultivated at the Company's mother plant in Fujisawa City, which is capable of handling high-mix, small-lot production, to our overseas plants so that this know-how can take root.

Isuzu systematizes this know-how into Isuzu *Monozukuri*. In addition, we regularly provide training to overseas employees engaged in production in order for them to acquire Isuzu *Monozukuri* concepts, methods, and production expertise. In fiscal 2022, a total of 656 employees attended training sessions on Isuzu *Monozukuri*, with each participant averaging 21 hours over a two- to five-day period.

In addition, at each manufacturing site, team leaders take the lead in continuous improvement activities through a short-term plan–do–check–act cycle. Through these improvement activities, team leaders and employees alike develop an awareness of the issues arising in their places of work, thereby raising the level of on-site capabilities. We share examples of improvements realized through these activities globally, which helps give them momentum.

By tirelessly implementing improvement activities, Isuzu will continue to evolve as a global *monozukuri* (manufacturing) company.

Quality control incorporating the Isuzu *Monozukuri* philosophy

Manufacturing site improvement briefing session

Isuzu's Value Chains

4 Providing Products to Our Customers around the World

Isuzu has expanded its distribution network and now delivers its products to more than 150 countries. (At a Glance: P.9)

Furthermore, to meet the needs of emerging countries in terms of durability and reliability, we develop and distribute pickup trucks and light-duty trucks geared toward such countries based on the technologies we have cultivated through our truck manufacturing track record.

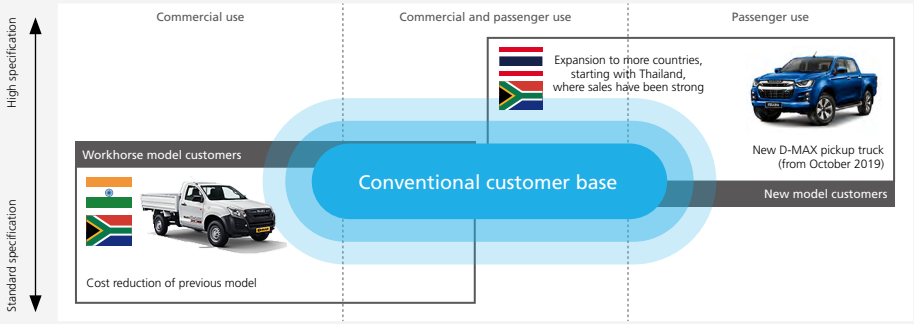
As such, it is our responsibility as a commercial vehicle manufacturer to continue to contribute to the construction of logistics infrastructure, thereby supporting economic development in emerging countries and the rest of the world.

Topic

Vehicles geared toward emerging countries

In 2019, the D-MAX pickup truck underwent a full-model change to enhance its competitiveness. We sought to expand its conventional customer base from those who use it as both a commercial and passenger vehicle to those who use it exclusively as a passenger car. In the future, we will produce the new D-MAX in Thailand, India, and South Africa alongside existing models to expand sales and meet the needs of customers around the world.

Expansion of D-MAX pickup truck customer base



Isuzu's TRAGA light-duty truck, a strategic product for emerging countries, has adopted commercial vehicle technologies cultivated by Isuzu to maximize loading efficiency, maneuverability, and fuel efficiency in pursuit of customer convenience. Currently, we are expanding sales of TRAGA in Indonesia and other emerging countries as well as in neighboring countries.

TRAGA, a light-duty truck geared toward emerging countries

5 Providing After-Sales Support to Maximize Vehicle Operation

We recognize that one of the most important needs of our customers is to keep their vehicles ready for use at all times in order to transport goods in a timely and appropriate manner.

In 2004, we launched MIMAMORI, a service capable of monitoring vehicle conditions that currently provides data on anomaly detection in customer vehicles. In addition, we offer PREISM, a service that uses the acquired vehicle condition data to minimize vehicle inspection and maintenance times.

We will further evolve these services in pursuit of optimizing our customers' vehicle operating times.

Topic

Advanced genuine maintenance service (PREISM)

Vehicle condition data × **Isuzu's genuine maintenance** = PREISM

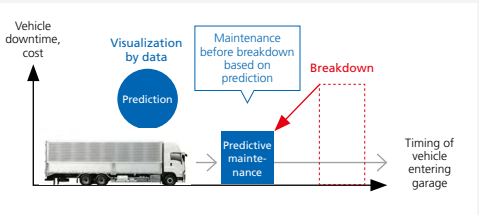
Identify condition of vehicle

Utilize vehicle condition data for high-quality maintenance

Advanced genuine maintenance service that utilizes vehicle condition data

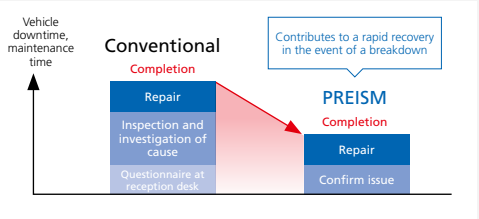
Mitigation of breakdowns

In the inspections and maintenance carried out at Isuzu's service plants, predictive and preventive maintenance is performed at the stage when predictive data is detected prior to a breakdown occurring. By utilizing vehicle condition data, it is possible to prevent and reduce the occurrence of breakdowns at an early stage with high accuracy, which greatly contributes to safe vehicle operations for our customers.



Reduced maintenance times

During the inspections and maintenance performed at Isuzu's service plants, it is possible to predict to a certain extent the type of maintenance needed prior to the arrival of vehicles by understanding vehicle condition data in advance, thereby improving maintenance efficiency and accuracy and shortening maintenance times.



Medium-Term Business Plan 2024

Every three years, Isuzu formulates a business plan with a view to achieving medium-term corporate growth. In May 2021, the Isuzu Group formulated Medium-Term Business Plan 2024 with an eye to achieving growth by fiscal 2024, the year ending March 31, 2024, and beyond. In order to achieve the targets set forth in the current plan, we will strive to further expand our existing businesses and increase revenues by leveraging the business foundation and various alliances we have cultivated. We will also strengthen ESG-focused management in order to become a sustainable company that can survive periods of great change and be recognized for its achievements.

Overview of Medium-Term Business Plan 2024

Expand Existing Businesses and Increase Revenues

Fiscal 2026 targets: net sales of ¥3.0 trillion and operating income of ¥300.0 billion

Enhancement of product, distribution, and service capabilities
Level-headed approach

***Monozukuri* (manufacturing) innovation**
Full utilization of alliances

Generate Innovation

Focus on the social mission required of commercial vehicles

Execution of carbon-neutral strategy
Completion of preparations for the shift to carbon neutrality over the next 10 years

Contributions to the evolution of logistics as a manufacturer of commercial vehicles
Promotion of co-creation activities with customers

Achievements of the previous medium-term business plan
Solid management foundation and firm alliances
Customer-oriented products and products that underpin transportation

Evolve Management from an ESG Perspective

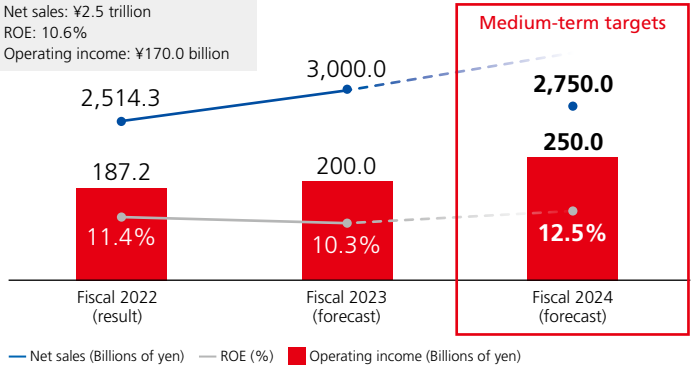
Promotion of transformation into a company that can survive even in times of great change

Emphasis on improving shareholder value
Responsibility to generate revenues and capital

Improvement of governance and information disclosure
Earning of trust from stakeholders

Transformation into a company that spurs innovation
The ability to respond to change and diversity

Targets for fiscal 2022, the year ended March 31, 2022
Net sales: ¥2.5 trillion
ROE: 10.6%
Operating income: ¥170.0 billion



Medium-Term Business Plan 2024 Progress

	Expand Existing Businesses and Increase Revenues	Generate Innovation	Evolve Management from an ESG Perspective
Targets	• Strengthening of alliances • Further improvements in productivity and pursuit of global expansion	• Execution of carbon-neutral strategy to achieve the targets set forth in Isuzu Long-Term Environmental Vision 2050 • Contributions to the evolution of logistics as a manufacturer of commercial vehicles	• Transformation into a company that can survive even in times of great change
Status of initiatives	• Beginning of joint development of a heavy-duty vehicle between Isuzu and UD Trucks Corporation as an initiative that will lead to future profits • Incorporation of Isuzu's modular design concept I-MACS,* with a full-model change of light-duty and medium-duty vehicles planned by the end of fiscal 2023 • In the light commercial vehicle business, promotion of the division of responsibilities among the three plants in Thailand, India, and South Africa as well as a shift to a structure in which plants in Thailand and South Africa can augment each other's production capacity	• Advanced development and demonstration testing of vehicles including light-duty fuel-cell vehicles (FCVs), heavy duty FCVs, heavy-duty transit FCV buses, electric pickup trucks, and North American battery-electric vehicles (BEVs) • Development of a heavy-duty transit BEV bus with the aim of introducing it to the market in 2024 • Promotion of collaboration with a wide range of data platforms through Transtron Inc. and Fujitsu Limited • In the area of automated driving, prioritization of use cases that are highly effective in terms of saving manpower, safety, and feasibility	• Strengthening of governance through such measures as transitioning to a Company with Audit and Supervisory Committee organizational system • Appointment of a chief coordination officer to promote management strategies alongside the chief financial officer, chief risk management officer, and chief information & security officer, thereby strengthening the Companywide management function responsible for management decision-making, strategic policy, and Companywide coordination • With the aim of strengthening our human resource foundation, launching of a personnel system reform based on the concept of diversity in fiscal 2022

* I-MACS: An abbreviation for Isuzu Modular Architecture and Component Standard, based on which the use and combination of components in vehicle development are optimized

Alliance System for Realizing Innovation

Collaboration with Cummins Inc. in the Powertrain Business

In February 2021, we reached an agreement with Cummins Inc. of the United States to collaborate on the development and sale of medium-sized diesel engines for the Powertrain Business and to conduct joint research into various advanced technologies.

Alliance details

- Sharing technological capabilities and know-how, complementing each other's strengths, and promoting cooperation that leverages economies of scale in various next-generation powertrains, including diesel engines with low environmental impact and electric powertrains

Main initiatives

- Cummins will supply Isuzu with medium-sized B6.7 diesel engines to use in medium-duty trucks. Vehicles equipped with this engine will be introduced to global markets to meet the needs of customers around the world.
- Isuzu and Cummins plan to install a Cummins' electric system in the Company's F-Series medium-duty commercial vehicles for the North American market and began monitoring for large-fleet customers in September 2022.

Strategic Alliance with the Volvo Group

Based on a basic agreement for forming a strategic alliance in the field of commercial vehicles concluded with the Volvo Group in Sweden, we started a full-scale strategic alliance in April 2021.

Alliance details

- Isuzu and the Volvo Group will promote collaboration in the development of existing and advanced technologies by mutually complementing their areas of expertise, leveraging each company's superior technologies, and collaborating to utilize economies of scale.
- Isuzu acquired UD Trucks Corporation and its business from the Volvo Group in April 2021, in order to further strengthen its heavy-duty truck business in Japan and international markets.
- The two companies will promote collaboration in light-duty and medium-duty trucks to respond to evolving urban logistics.
- Both companies will pursue mutual benefits from increased sales volumes through collaborative purchasing based on mutual technologies and deployment regions.

Main initiatives

- Isuzu and UD Trucks plan to launch their new tractor heads in Japan around 2023. In the future, both companies will start development via their large shared platform of a full-model change for their heavy-duty trucks in Japan and overseas markets, with an eye to collaborating with the Volvo Group in the area of advanced technologies.
- In addition, under the leadership of the Alliance Board, consisting of the president and representative director of Isuzu, the CEO of the Volvo Group, and executives from both companies, the Company will promote activities that leverage the advantages of the alliance, including the establishment of alliance offices in both Japan and Sweden, and the development of a corporate culture and management from an ESG perspective.

Collaboration with Participating Partners in Commercial Japan Partnership Technologies (CJPT)

Isuzu participates in Commercial Japan Partnership Technologies (CJPT), a joint venture established in March 2021, in which it has begun collaboration with participating partners to accelerate the response to connected, autonomous, shared & service, and electric (CASE) technologies and services in commercial businesses.

Alliance details

- Promote the planning of CASE technologies and services in commercial businesses
- Jointly develop electric and fuel-cell vehicles, automated driving technology, and electronic platforms, with a focus on the light-duty truck domain
- Jointly build a commercial version of the connected technology platform and provide various logistics solutions

Main initiatives

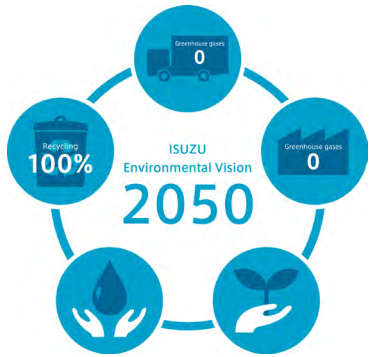
- Plan and develop a next-generation, hydrogen-fuel-cell electric route bus based on the heavy-duty battery-electric route bus scheduled to commence production in fiscal 2025
- Commence planning and basic research on hydrogen engines for heavy-duty commercial vehicles
- Develop light-duty fuel-cell trucks, which are scheduled to be introduced to the market through social implementation projects in Fukushima Prefecture and Tokyo from January 2023 onward

Isuzu's Medium- To Long-Term Strategy for Realizing Innovation

As a medium- to long-term strategy, Isuzu will realize innovation in the areas of next-generation product development to help facilitate carbon neutrality and of new product development geared toward evolving logistics.

In March 2020, the Company outlined the environmental aspects of its business activities—including those related to carbon neutrality—from a long-term perspective in Isuzu Long-Term Environmental Vision 2050. To further clarify the Company's environmental vision from a medium- to long-term standpoint, Isuzu announced its new 2030 Environmental Roadmap in June 2022.

Moving forward, Isuzu will continue to grow and provide value to society through the approaches, initiatives, and product development activities listed below.



		Examples of approaches and initiatives		Relation to Product Value		
				Low environmental impact	Easy to use	Durable and long lasting
Realizing Innovation	Next-Generation Product Development to Help Facilitate Carbon Neutrality	Business-Wide Carbon Neutralization	Page 25	●	●	
		Realizing a Circular Economy	Page 25	●	●	
		Developing Carbon-Neutral Vehicles That Meet Diverse Needs	Page 26	●		
		Taking On the Challenge of Achieving Net-Zero Greenhouse Gas Emissions in Isuzu's Business Activities	Page 28	●	●	
	New Product Development Geared toward Evolving Logistics	Expanding Value Provided through the Evolution of Fleet Management and Operational Support Services	Page 29	●	●	●
		Development of Automated Driving Technologies	Page 30	●	●	●
		Development and Application of Advanced Safety Technologies	Page 31	●	●	●
		Development of More User-Friendly Rear Bodies			●	

Business-Wide Carbon Neutralization

The various global environmental issues caused by climate change are having a dramatic impact on our society. There is now a common awareness around the world that such issues are of paramount importance and must be addressed urgently.

In light of this awareness, countries are rapidly advancing their carbon-neutral strategies and accelerating the shift toward a global decarbonized society. We at Isuzu view this as an opportunity for further growth and, to this end, are intensifying our efforts to become carbon neutral.

Isuzu conducted a scenario analysis based on long-term environmental scenarios for 2050 to identify risks and opportunities. As a result, we reaffirmed that climate change and other global environmental issues have a major impact on the Isuzu Group's business activities and product range. To counteract climate change, it is essential that we respond to stricter environmental regulations and develop new technologies. Furthermore, natural disasters are becoming increasingly frequent and severe due to climate change and carry with them the potential to significantly impact Isuzu's business activities. At the same time, Isuzu is expected by society to realize innovation that contributes to a decarbonized society, and we recognize that appropriately responding to these expectations will lead to new business opportunities for the Company.

Amid this social backdrop and with the results of the Company's own analysis as its basis, Isuzu will further promote the shift to carbon neutrality in all of its business operations, guided by Isuzu Long-Term Environmental Vision 2050.

Realizing a Circular Economy

Isuzu aims to recycle 100% of its waste and end-of-life vehicles by 2050 and will thus promote activities geared toward realizing a circular economy.

The linear economic system of mass production, mass consumption, and mass disposal has already reached its limits. Isuzu recognizes the need to review such a system and shift to a circular economic system by expanding businesses that rebuild, remanufacture, and reuse resources and by further promoting the efficient and cyclical use of said resources.

It is essential that we use limited resources carefully, collect them after use, and reuse them in a cyclical manner while maximizing added value. Isuzu anticipates that next-generation vehicles developed to achieve carbon neutrality and realize a decarbonized society will spur calls for novel approaches to certain resources, such as the adoption of new materials. In addition, it is hoped that materials that are difficult to recycle with currently available technologies will be recycled through technological innovation and other means. By ensuring that we address these issues, we will further promote the effective use of resources and aim to conduct business activities in line with a circular economic system that does not generate waste.

Business-Wide Carbon Neutralization

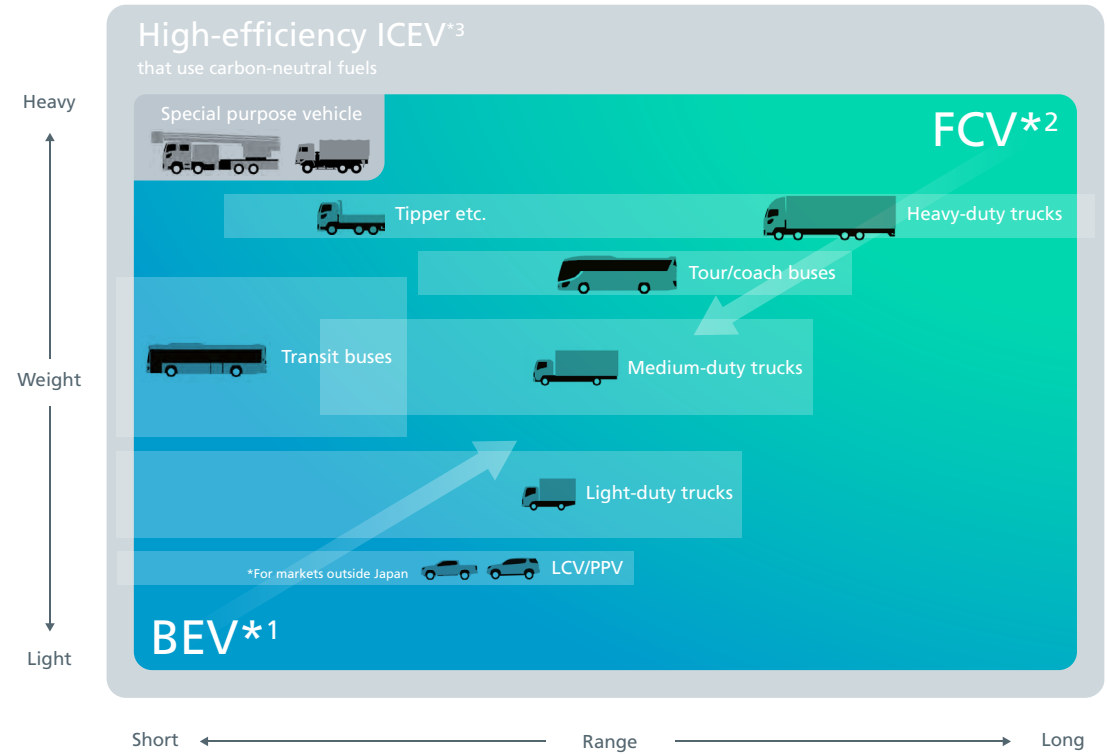
Developing of Carbon-Neutral Vehicles That Meet Diverse Needs

Isuzu aims to achieve net-zero greenhouse gas (GHG) emissions throughout the entire life cycle of its products by 2050.

In order to do so, the Company's entire lineup of new vehicles sold worldwide must be carbon neutral. However, the type of carbon-neutral vehicles required will vary depending on how a given vehicle is used and where it is used. We will respond to the diverse needs of the various customers and continue to support the transportation all over the world by offering a wide lineup of carbon neutral vehicles.

We believe that the development of carbon-neutral vehicles calls for the pursuit of more efficient internal combustion engines, the use of carbon-neutral fuels, the combination of new technologies, and the promotion of electrification. Through alliances with our various business partners, we are confident that we can offer carbon-neutral vehicles for a variety of applications and will identify the technologies required for this endeavor by 2025.

Isuzu's Lineup of Carbon-Neutral Vehicles That Meet Diverse Needs



*1 LCVs, light-duty trucks, route buses, etc., that travel short distances and are lightweight
*2 Heavy-duty trucks, sightseeing buses, and other large vehicles that travel long distances
*3 Special-purpose vehicles such as fire engines, etc.

Main Initiatives Geared toward Carbon-Neutral Vehicle Development

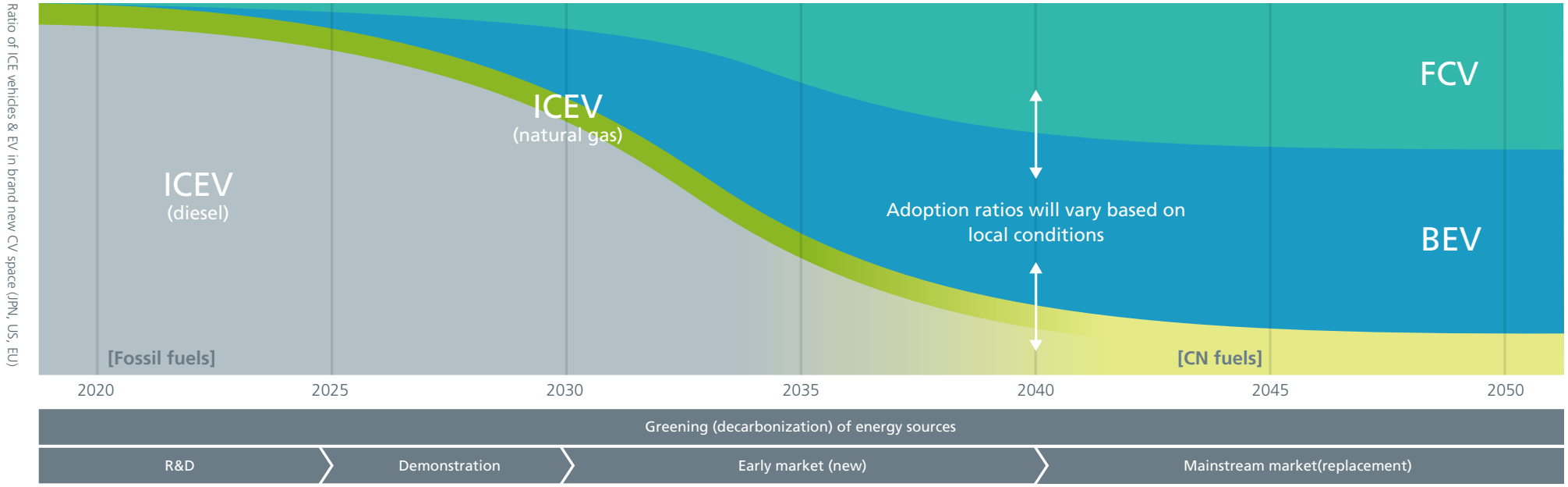
Main Initiatives	Summary of Initiatives and Future Plans
Commence mass production of light-duty battery-electric vehicles	• Based on the knowledge gained from the monitoring trials conducted since 2019, Isuzu launched a compact battery-electric truck in the Japanese market in fiscal 2023, which the Company plans to steadily roll out to North America and Europe. • In Japan, models compatible with ordinary driving licenses are scheduled for release in due course.
Commence introduction of fuel-cell vehicles to the market	• Isuzu is promoting the planning and development of a mass-market light-duty fuel-cell truck in collaboration with partners participating in Commercial Japan Partnership Technologies (CJPT). • Market introduction is scheduled to begin in January 2023 through social implementation projects in Fukushima Prefecture and Tokyo.
Commence monitoring trials of medium-duty battery-electric vehicles for the North American market	• Isuzu and Cummins Inc. have installed a Cummins electric system in Isuzu's F-Series (FTR) medium-duty commercial vehicles for the North American market, and both parties began monitoring the system for a major North American fleet customer in September 2022.
Commence monitoring trials for heavy-duty fuel-cell vehicles	• Joint research on heavy-duty fuel-cell vehicles began in 2020 in collaboration with Honda R&D. Further, Isuzu will promote vehicle manufacturing with the aim of conducting demonstration tests using monitoring vehicles by the end of fiscal 2023. Through demonstration tests, we will be able to provide feedback on ease of use and technical issues, which will be utilized in the development of mass-produced vehicles in the future.
Commence production of heavy-duty battery-electric route buses	• From fiscal 2025, Isuzu and Hino Motors, Ltd. will begin production of large battery-electric route buses through their joint venture J-Bus. • Compared with conventional non-step buses, these new buses have a much larger, fully flat area, thereby improving safety for travelers and contributing to our aim of eliminating onboard passenger accidents entirely.
Commence consideration for the development of heavy-duty fuel-cell route buses	• Isuzu, in collaboration with partners participating in CJPT, will begin consideration for the planning and development of next-generation, fuel-cell route buses based on the aforementioned large battery-electric route buses. • By standardizing their parts, the cost of battery-electric vehicles and fuel-cell vehicles will be significantly reduced, thereby spurring the adoption of a new generation of fuel-cell stacks. We will also leverage the expertise of Toyota Motor Corporation and Hino Motors in the area of fuel-cell electric bus development, aiming to provide electric vehicles with longer service lives and higher added value.

Business-Wide Carbon Neutralization

Developing of Carbon-Neutral Vehicles That Meet Diverse Needs

The process encompassing the research and development of carbon-neutral vehicles to their social implementation and popularization varies depending on the social infrastructure and energy use by country and region and thus cannot be approached in a uniform manner. However, based on projected social changes, it is expected that, while the scale of expansion will vary depending on regional conditions and social trends, the number of carbon-neutral vehicles will gradually increase among the various options available. Taking such social conditions into consideration, Isuzu will work to promote carbon-neutral vehicles tailored to the characteristics of each country and region.

Projected Carbon-Neutral Vehicle Expansion



* ICEV (Internal Combustion Engine Vehicle): vehicles powered by fuels such as diesel, gas, and CN fuels
* CN fuels: carbon neutral fuels such as bio fuels and synthetic fuels derived from renewable energies.

Research and Development Period
We will proceed with demonstration tests for the social implementation of various carbon-neutral vehicles and promote research and development from the perspective of economic rationality, among other factors.

With customers' needs in mind, Isuzu will identify optimal technologies to support a diverse range of applications by 2025.

Social Implementation Period
In 2025 and beyond, we will utilize the knowledge and data obtained from the demonstration tests to expand and improve our product lineup and expand mass production and sales, thereby promoting the social implementation of carbon-neutral vehicles.

Popularization Period
From 2030 onward, the initial cost of carbon-neutral vehicles is expected to decrease as development costs are reduced through our leveraging of alliances and other means. In addition, running costs are expected to decrease due to social changes such as the spread of infrastructure, commonality with other companies' products, and standardization. By reducing the burden on customers through such cost decreases, it is likely that we will enter a period of popularization whereby switching to a carbon-neutral vehicle will become a viable option for customers.

Transitional Period
Around the time of the popularization period, we expect that customers using existing vehicles will gradually switch to carbon-neutral vehicles and that the number of carbon-neutral vehicles in their fleets will increase. At the same time, carbon-neutral fuels are expected to become widely used from around 2040, and we anticipate that existing internal combustion engines will be encouraged to become carbon neutral through the use of carbon-neutral fuels.

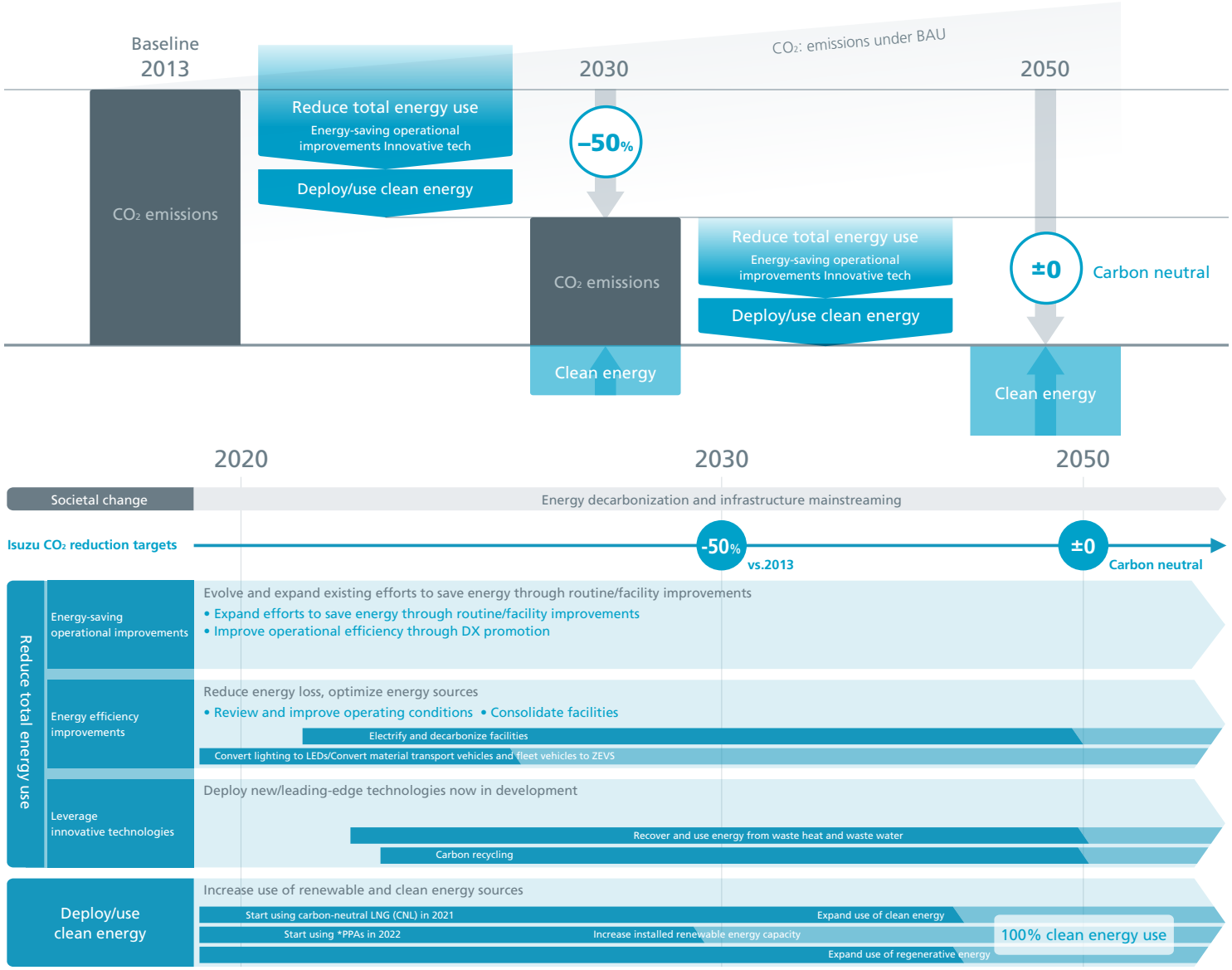
Business-Wide Carbon Neutralization

Taking On the Challenge of Achieving Net-Zero Greenhouse Gas Emissions in Isuzu's Business Activities

In the process of promoting a business-wide shift to becoming carbon neutral, the Company must achieve carbon neutrality not only in its products and services but also in the greenhouse gases emitted directly from its own business activities.

Isuzu has begun taking on the challenge of reducing CO_2 emissions directly from its business activities—Scope 1 and Scope 2 emissions—by 50% from 2013 level by 2030 and to achieve carbon neutrality by 2050.

The Isuzu Group, both in Japan and overseas, will continue to take on the challenges of reducing total energy use, introducing and expanding clean energy, and implementing innovative technologies with a view to realizing a future where carbon-neutral products are produced at carbon-neutral plants.



*PPA: Power Purchase Agreement

Expanding Value Provided through the Evolution of Fleet Management and Operational Support Services

Isuzu has been an industry pioneer in providing connected services that support its customers' businesses, such as the MIMAMORI fleet management service and the PREISM advanced genuine maintenance service. In October 2022, a platform for connecting commercial vehicle data will begin operation and start providing advanced connected services based on information on approximately 500,000 trucks.*1 Specifically, the platform will contribute to the creation of prosperous lifestyles by supporting the construction of a logistics infrastructure that enables goods to be delivered in a timely, safe, and accurate manner through the further advancement of fleet management and operational support services. Furthermore, the platform will contribute to a reduction in CO_2 emissions by optimizing transportation efficiency. In the future, we will contribute to resolving social issues such as energy management in the era of electric vehicles, including through the optimization of electric vehicle charging.

*1 500,000 is the total number of trucks (including existing vehicles) from which data was collected by Isuzu and Transtron Inc.

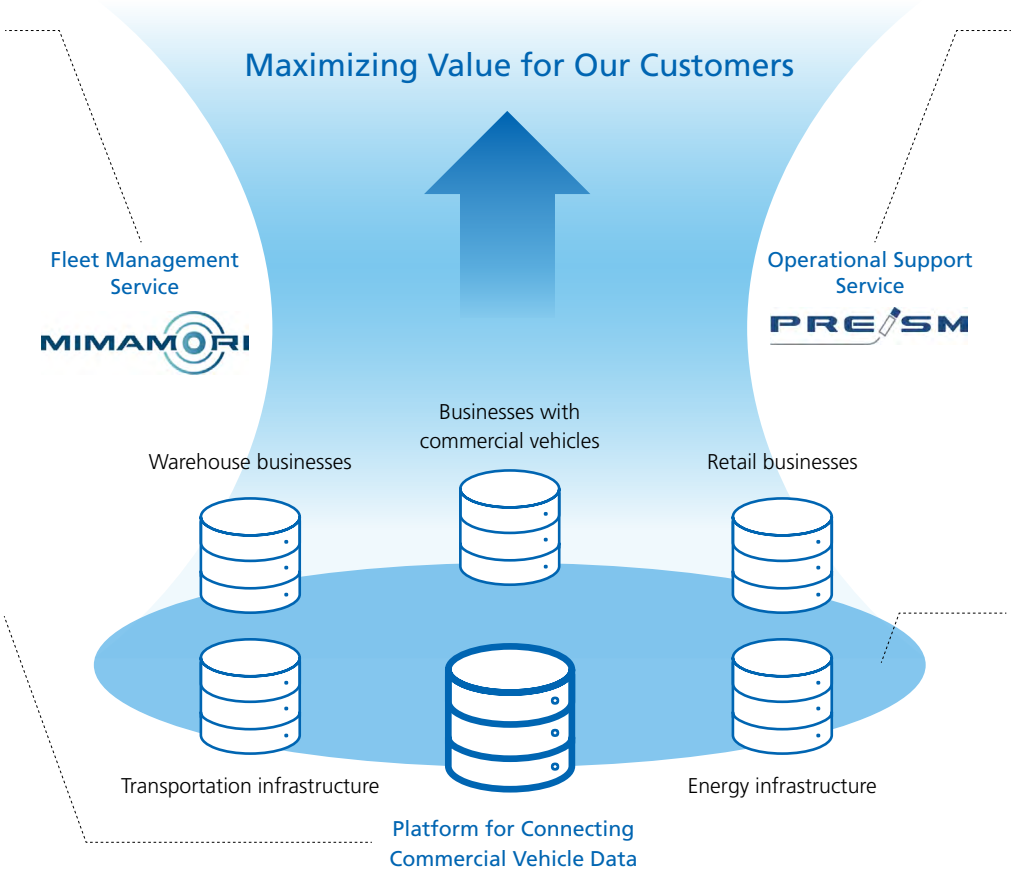
MIMAMORI Fleet Management Service*2

- This fleet management service supports the optimization of customers' delivery operations and labor management by aggregating and analyzing fleet operation information.
- As a next-generation function, the abovementioned platform for connecting commercial vehicle data will be linked to the systems of retailers and warehouse operators, connecting a series of logistics-related processes and optimizing transportation efficiency.

*2 This service allows customers to collectively manage all of their vehicles, including those manufactured by brands other than Isuzu.

Synergies of Isuzu, Transtron Inc., and Fujitsu Limited

- By leveraging the synergistic benefits of Isuzu's wide range of services that utilize vehicle data, Transtron Inc.'s various operational support services, and Fujitsu Limited's latest digital transformation technology, we will be able to promptly respond to various issues in the logistics industry.



Operational Support Service (PREISM)

- This is an operational support service that utilizes vehicle data to maximize customers' vehicle operation times by assisting in preventing breakdowns before they occur and quickly repairing them when they do.
- The platform for connecting commercial vehicle data will undergo further evolution by expanding the scope of monitoring and revamping the user interface.
- The platform supports the safe operation of our customers' vehicles by responding to the enhancement of safety functions and the increasing sophistication of electrification.

Synergistic Benefits from Linkage with Social Infrastructure Information

- The platform for connecting commercial vehicle data is linked to social infrastructure information such as transportation and energy information, thereby contributing to the resolution of various social issues.
- For example, the service is expected to utilize traffic volume data unique to trucks with high utilization rates and energy information for electric vehicles.

Development of Automated Driving Technologies

Through joint development with our various partners, we will accelerate initiatives geared toward the realization of automated driving and implement measures to verify and promote the benefits of improved safety, efficiency, and autonomous driving not only in logistics but also in various applications.

Application	Details of Initiatives
Expressways and Heavy-Duty Trucks 	• The Company is participating in the Japanese government's "Road to the L4" project to accelerate implementation of advanced mobility-as-a-service (MaaS) initiatives such as autonomous driving. The project entails research, development, and social implementation for advanced mobility services such as Level 4 automated driving. In cooperation with logistics companies and heavy-duty truck manufacturers, we will contribute to efforts toward the practical application of high-performance trucks, including platooning on expressways, and social implementation initiatives from 2026 and beyond. • Isuzu is proceeding with the commercialization and market launch of a 2020 model GIGA truck equipped with all-speed adaptive cruise control and a lane keep assist system, while researching automated driving technologies exclusively for heavy-duty trucks, with certain of these technologies being utilized in the development of mass-produced vehicles.
Low-Speed Driving and Parking at Ports 	• Isuzu will participate in the Ministry of Land, Infrastructure, Transport and Tourism's demonstration test project for the automation of incoming off-site trailers at ports, which is part of the ministry's efforts to realize AI terminals that support people. The project aims to improve the working environment for drivers of incoming off-site trailers and to maintain the transportation capacity of shipping containers. • In cooperation with manufacturers of heavy-duty vehicles, Isuzu will contribute to the development of an environment in which automated trailers can be introduced at ports, while verifying the safety of operating automated incoming off-site trailers in restricted off-road areas.
Manufacturing Sites and Transportation 	• By the second half of fiscal 2023 an automated driving experiment will be conducted on one route of the granulated slag transportation course at Kobe Steel, Ltd.'s Kakogawa Works, using a vehicle capable of Level 4 limited-area automatic driving based on UD Trucks Corporation's heavy-duty truck Quon. • Isuzu will promote the creation and practical application of solutions that utilize autonomous driving technologies through co-creation with UD Trucks.
Restricted-Zone Buses 	• The Company will promote the automated operation of large route buses in restricted zones by conducting demonstration tests while utilizing the technology of start-up companies, with the aim of contributing to increased passenger traffic and improved people flow efficiency by eliminating driver shortages. • Demonstration tests were conducted for one month from March 2022 in a closed space along the connecting bus route between the domestic and international terminals of Fukuoka Airport. • Isuzu will realize the automated operation of route buses on ordinary roads in the future, contributing to securing means of transportation in rural areas.
Urban Area Delivery Vehicles 	• In collaboration with the U.S. semiconductor manufacturer NVIDIA Corporation, Isuzu is promoting development by combining NVIDIA's driving environment recognition technology used in passenger cars with Isuzu Advanced Engineering, Ltd.'s decision-making and control technology. • The Company began verification tests of automated operation in urban areas on the Fujisawa Plant premises from 2020 and will subsequently expand testing areas from 2021 onward. • Collaboration with Isuzu Technical Center of America, Inc. was strengthened in 2022 to promote the development of cutting-edge technologies.

Development and Application of Advanced Safety Technologies

Streamlining Daily Inspections through the MIMAMORI Driver's App

On March 1, 2022, Isuzu launched the operation of the MIMAMORI driver's app throughout Japan, the country's first operational management smartphone application* developed by a commercial vehicle manufacturer, as a new service that utilizes connected technology in commercial vehicles and which contributes to resolving social issues faced by commercial vehicle customers.

The MIMAMORI driver's app is a smartphone application linked to MIMAMORI, Isuzu's telematics service for commercial vehicles. As a new service, we have added the functions of pre-operational daily inspections and cargo-handling operations, and the application also allows the user to streamline safety confirmation processes. The daily inspection function has been refined through trials of PRE START CHECK, a daily pre-operational inspection application announced in 2019, and now enables a single person to perform inspection tasks previously performed by two people, saving labor and reducing time spent on tasks. In addition, users now have the ability to record inspection data via their smartphone.

* According to a survey by Isuzu

Image of daily inspection function

Image of cargo handling operation

Examples of the Application of Advanced Safety Technologies

Isuzu has contributed to a reduction in traffic accidents through the application of advanced safety technologies such as advanced driver-assistance systems. Through the further development and advancement of safety technologies, we aim to realize a society in which drivers can feel safe at the wheel and society at large can have peace of mind.

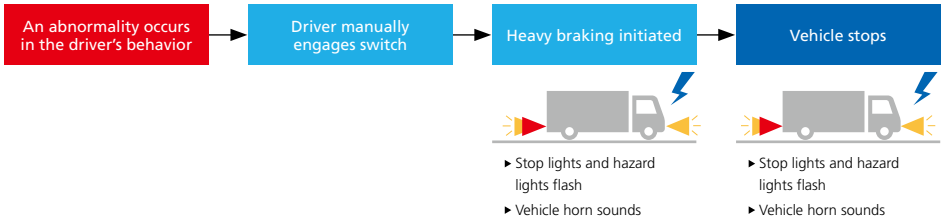
❶ Blind Spot Monitor

This is a system that not only emits millimeter-wave radar in all directions of the cab to detect cars, motorbikes, bicycles, and pedestrians in the driver's blind spot area but also alerts the driver via an alarm and warning lights on the truck's pillars. It is effective in reducing traffic accidents in such situations as turning right and left at intersections, facing oncoming vehicles, and changing lanes.

❷ Emergency Driving Stop System (EDSS)

In 2021, Isuzu's heavy-duty truck GIGA became the first truck in Japan to adopt EDSS. This system brings the vehicle to an emergency stop when the device automatically detects an abnormality in the driver's behavior, or if the driver suddenly becomes ill or otherwise becomes unable to continue driving safely while the vehicle is in motion, and manually engages the EDSS switch.

Manual Operation by the Driver



Automatic Operation by EDSS