Technology



We are working to streamline our development structure and reform the development process to maximize development efficiency and investment effect. This will enable us to practice user-first technology development and broaden the global Casio fanbase.

KAWAI Tetsuya

Executive Managing Officer, Senior General Manager, Engineering Headquarters

Targets and **Indicators**

- Development ROI*1: 15% increase over 3 years
- Development added value per head: 15% increase over 3 years
- *1 A Casio-specific indicator calculated by dividing added value by total investment sum

Basic Approach

The Engineering Headquarters has made its mission to continuously broaden the global Casio fanbase with a user-first approach. To reflect this approach, we place emphasis in our day-to-day activity on enhancing both "product concept," which forms user expectations in terms of function, performance, and design, and "product performance," which refers to quality and user-friendliness after purchase and use.

We see ROI, which indicates added value from development investment, and added value per head of the development staff as key management indicators. Corresponding targets are set and monitored in each business and product area and the plan-do-check-act (PDCA) cycle is implemented with strong focus on the status of value creation and improvement.

Key Strategies and Specific Initiatives

A key strategy is streamlining of the development structure to achieve flexible allocation of development resources and sharing of technological know-how based on the management policy of strengthening software solutions from a Companywide perspective. At the same time, we work on reforming the hardware development process with a view to maximizing development efficiency and investment effect.

In the area of process reform, we are now beginning

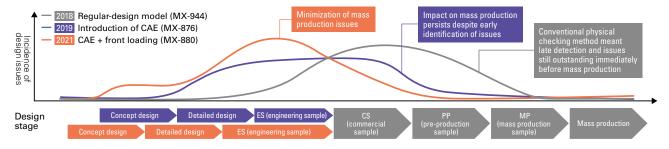
to reap the benefits of using digital engineering to reform mechanical development. This has meant introducing CAE*2, test automation, and other reforms to achieve a "front-loaded" development process with fewer design changes and backtracks. This improves quality by raising the efficiency of the various quality analysis and test procedures, which in turn optimizes costs and shortens the development period. Based on its successful application so far in the Electronic Musical Instruments Business and the positive results also seen with scientific calculators and in other areas, going forward we will roll out this approach to development in other product areas.

Meanwhile, in line with the Casio Green Targets, we are also focusing on environmental initiatives in the areas of design and technology. These consist of innovation in solar cell technology, development of biomass and other environment-friendly materials, adoption of mercury-free light sources, and development of plastic-free packaging.

To strengthen our technology platform, we will undertake technology development from a medium- to long-term perspective based on our business strategy. Here, we will utilize to the maximum Casio's core competence in aspects from robustness and design quality to compactness, low energy consumption, and perceived quality, while emphasizing co-creation with outside partners and hiring and development of human resources for acquisition of new skills.

*2 Computer Aided Engineering: A design technology that improves quality with fewer prototypes by using virtual prototyping and testing from the initial development stage.

Result of applying digital engineering in the Electronic Musical Instruments Business



Production and SCM



We are progressing with production and supply chain reform based on a shift to smart factories, aiming to offer new experiential value through flexible and prompt supply of the products customers need.

SHINODA Yutaka

Executive Managing Officer Senior General Manager, Production Headquarters

Targets and **Indicators**

Benefits of digital transformation of processes from development to production:

- Production lead time shortened by One month
- Establishment of build-to-order (BTO) production structure responsive to market needs
- FYE 3/2024 Added value productivity: 20% increase per head
- 15% increase per cost unit (compared to FYE 3/2020)

Basic Approach

Since the fiscal year ended March 31, 2018, Casio has worked on the restructuring of production bases centered around the Yamagata mother factory and on the standardization of production processes. This has achieved an increase in the in-house production ratio, higher efficiency at our own production bases, and resolution of quality issues. Starting from the fiscal year ended March 31, 2021, under a management strategy focused on the user experience, we have sought to realize flexible and prompt supply of more personalized products by reforming the supply chain and production bases through a shift to smart factories, coupled with procurement and distribution reform.

Key Strategies and Specific Initiatives

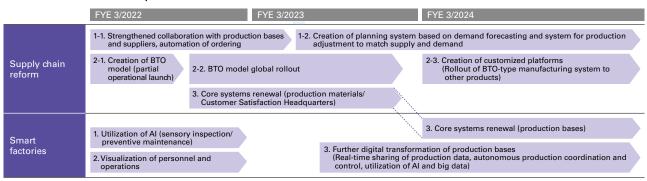
The supply chain reform involves reengineering, ICT expansion, and systems integration to link sales plans with production and procurement plans in real time. We are progressing with system development to switch from monthly to twice monthly demand forecasts, link development and production data, and create platforms. We plan to install and begin operation of core processes by late March 2022 and to expand their scope the following fiscal year. Our medium-term

target is to shorten sales lead time from 3 to 2 months. The tight supply situation in the semiconductor market is becoming increasingly serious and prolonged. As we press ahead with reform, we will watch closely the resulting impact on business and take measures to secure stable supplies.

In production base reform, we are focusing on automation and visualization to prepare each of our production bases for autonomous operation. In the fiscal year to March 2021, following its already advanced introduction in timepiece operations, we drove automation in digital pianos and scientific calculators, starting mainly in inspection processes. Next, we will design new production lines ahead of expansion of the products covered and process digitalization. We have also set about structural reform of our business bases through fundamental review of facilities, staff, and costs. Based on the positive results of reform at bases in Shenzhen, Hong Kong, and Zhongshan in the fiscal year to March 2021, we will proceed with measures to reduce indirect costs and optimize staff levels.

In procurement, we are pursuing initiatives such as data linking and collaborative DX with co-creation partners. In distribution, we have responded to the expansion of e-commerce and rising distribution costs with moves to introduce robotic process automation and increase outsourcing.

Medium-term Roadmap



Sales and Marketing



While promoting digital marketing and strengthening of the brand, we will provide optimal value by connecting with each and every user through the practice of One2One marketing.

Senior Executive Managing Officer KASHIOTakashi Senior General Manager, Global Marketing Headquarters

Targets and **Indicators**

- Number of ID-registered G-SHOCK fans: 5 million
- Number of educators registered in the global educator network: from 50 thousand in FYE 3/2021 to 180 thousand in FYE 3/2024

Basic Approach

To deliver new user experiences and create culture, we need to provide optimal value by connecting with each and every user. To do that, the Global Marketing Headquarters has declared One2One marketing as its basic policy going forward, which will be realized in a way unique to Casio utilizing digital marketing. Under this approach, by applying the right marketing cycle for each region, we aim to create optimal products and at the same time establish a clearly defined market position in each business.

Currently, we are working to increase the accuracy of target management, define and strengthen functions, and promote streamlining and increased efficiency in the marketing structure. Building on this foundation going forward, we will roll out the three key strategies outlined below while at the same time accelerating brand strengthening initiatives in each business.

Key Strategies and Specific Initiatives

The first key strategy is strengthening of electronic commerce (e-commerce). We will seek to enhance our e-commerce websites, including directly managed businesses, and related service structures. In parallel, we will work to reform our marketing style to better identify user needs. In the Timepiece Business specifically, where the aim is to achieve five million ID-registered loyal fans, we are engaged in preparations for the introduction of an

integrated management system for user data and are also working on the utilization of digital behavioral analysis tools.

The second key strategy is strengthening of direct connections with users. We will introduce measures to continuously strengthen relationships with users, including analyzing user needs. In the Timepiece Business, by locating new global flagship stores in major cities and training staff for our specialty stores, we will promote an omnichannel network of e-commerce and physical stores. In the Education Business meanwhile, amid a rapidly changing environment, we will seek to fully exploit our asset of close links with schools and teachers to build new educator platforms and develop optimal sales and marketing activities for schools.

The third key strategy is collaboration with distribution partners. We will accelerate collaboration with distributors, who have strong marketing ability, to offer special experiences to each and every user. In the Timepiece Business, we will collaborate in product and sales promotion with partners equipped for joint brand creation, including through e-commerce. In the Electronic Musical Instruments Business, our initiatives will include leveraging collaboration with distributors who have a core usership to fully exploit potential demand in the hobby and educational markets.

In parallel with these key strategies, we will work to realize continuous improvement in marketing efficiency through initiatives to strengthen the profit structure with enhanced product value and an improved product mix, initiatives to optimize the cost structure, and implementation of organizational restructuring.

Examples of key marketing strategies by business

Key strategy	Timepiece Business	Education Business	Musical Instruments Business	System Equipment Business
Strengthening of e-commerce	Strengthening of direct sales and online store functions	Strengthening of direct sales to schools	• e-commerce	 Digitalization support for suppliers
Strengthening of direct connections with users	Increase in lifetime value Development of fan communities	Expansion of educator network Strengthening of software business	Provision of self-learning services	Customer capture through integration of manufacturing and marketing
Collaboration with distribution partners	Strengthening of specialty distribution channels	Development of specialized model	Improvement of experiential value	Adaptation to cashless operation

CS



To increase customer satisfaction and inspire trust and confidence in the Casio brand, we work to raise product and service quality and enhance after-service.

KASHIO Tetsuo

Director, Member of the Board Executive Managing Officer Senior General Manager, CS Headquarters

Targets and Indicators

- No. of accidents: 0 No. of legal infringements: 0 No. of serious quality issues: 0
- Customer satisfaction (speed of repair, telephone and email response rate, etc.)

Basic Approach

At the Customer Satisfaction (CS) Headquarters, we work to improve the quality of service for products and apps and other customer purchases and to enhance after-service.

As an organization independent of the different business department, we establish uniform Companywide quality standards and maintain oversight to ensure that products meet these standards as well as complying with the laws and regulations of each country. In this way, we seek to inspire customer trust and confidence in the Casio brand.

We also collect and analyze inquiries from customers actually using our products and services and data on products sent in for repair. We share our findings with the relevant departments and implement the plan-do-check-act (PDCA) cycle as a way of improving products and services and thereby increasing customer satisfaction.

Particularly now, with the products and services of each of Casio's businesses shifting from use to experience, product structure is becoming increasingly complex to enable compatibility with apps and other companies' products. This means that greater skill and expertise is required to give clear and simple instructions for use and to identify the cause of product malfunction.

Establishing a dedicated repair line for high-priced timepieces is one example of how we have put in place a system that is able to respond sensitively to different customer expectations in different price bands.

Key Strategies and Specific Initiatives

Given this situation, one of Casio's medium- to long-term aims is to create a customer satisfaction improvement cycle through introduction of a new customer feedback analysis system.

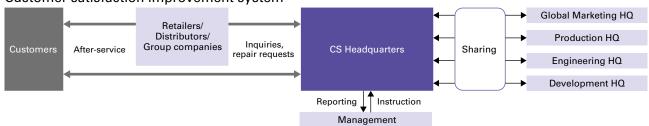
We will build a database gathered not only from direct customer inquiries but also product reviews received through dedicated apps and feedback from social media and the e-commerce website. We will use the findings from analyzing these data to support quality improvement for products, apps, and other items.

For example, in our new Sports and Health Business, we are working to build and reinforce a joint platform with ASICS Corporation to strengthen services delivered through the Internet and online apps.

In the Education Business, we have set up a support system for students and teachers to contribute to the rollout of ICT in educational environments.

We are also working to upgrade our repair management system, which also covers overseas Group companies. The introduction of the new system is designed to increase the efficiency of repair operations and speed up the provision of information, thereby increasing customer satisfaction.

Customer satisfaction improvement system



Organization and Human Resources

Stimulating Organization and Human Resources

To come out on top of severe competition and grow sustainably as a company, it is vital to maximize the value of our human resources, among our various management resources, who are responsible for carrying out business activities. Therefore, Casio recognizes the critical nature of enhancing human resources development compatible with social structure and environmental changes as well as developing a workplace environment that enables our diverse pool of people to meet their full potential.

Improvement and Evolution of Personnel System

In order to promote the growth of the individual and corporate development in a management environment undergoing dramatic change, employers need to establish a human resource platform that enables each employee to acquire expertise and perform as a true professional.

As part of that aspiration, we have carried out a revision of our executive ranking system to clearly define the role and skills required of specialists at each rank. This is intended to enable not only managers but also specialists to envisage in concrete terms their future career path and growth. Additionally, we have upgraded the overall job definition table and created a clear definition table for each separate job category to clarify the designation of specialist jobs, which had previously not been standardized.

Provision of Workplace Environments That Enables All Employees to Meet Their Full Potential

Casio has approximately 10,000 employees groupwide with varying personalities and talents. Given changes in the social environment along with employees' values and lifestyles, we recognize the importance of practicing corporate management that leverages diversity as a strength in response to these changes.

One of the material CSR issues we identified is "providing a comfortable workplace and promoting diversity." We are working to develop a comfortable workplace for women and people with disabilities, including various childcare support measures, in addition to promoting work-life balance through flexible work formats

in terms of time and space, such as working from home and staggered work hours. Toward this end, we have established targets for the rate of employees taking childcare leave and returning to work afterwards, the ratio of women in recruitment, and statutory employment rate of people with disabilities.

Based on the approach outlined above, in 2020 we introduced three systems that enable staff to work in a way that suits their individual lifestyle: working from home, flexible work hours, and free dress code. The aim of flexible work hours is to maximize performance by enabling employees to set the time when they can best concentrate on work duties so as to achieve an improved work-life balance and improved health.

The introduction of the free dress code establishes the guideline that individual employees may choose their own style of dress to suit the circumstances. We hope that this will help to create a corporate culture that encourages employees to act on their own initiative, be receptive to information, and think flexibly.

We have also introduced a system allowing dual and second occupation. All employees have been released from the prohibition on taking up second occupation outside work hours either as a contract employee or through self-employment. Employees aged 50 years or above are now allowed to take up dual occupation with another employer for up to two days a week.

3 New Systems

- Reform of work location: Working from home
- Reform of work hours: Flexible working
- Reform of work environment: Free dress code



Human Rights / Supply Chain Management

Human Rights

Basic Approach

Casio operates its business globally and its business activities depend on relations with various stakeholders. Casio understands that, in the course of pursuing its business activities, there is the potential for it to be involved in negative impacts on the human rights of a diverse range of stakeholders. An insufficient response to human rights issues can develop into serious business risks such as significant decline in the corporate brand value, product boycotts and suspension of business transactions by business partners. As it continues with global business expansion going forward, Casio recognizes respect for human rights as a key sustainability issue and is committed to strengthened initiatives based on international human rights-related codes of conduct.

Main Initiatives

On July 1, 2014, we established the Casio Group Basic Policy on Respect for Human Rights. The Basic Policy specifies, among other things, the Group's commitment to supporting and respecting international codes of conduct, to implementing ongoing human rights initiatives based on the United Nations Guiding Principles on Business and Human Rights, and to putting in place and operating a system for human rights due diligence. We ensure that all employees are familiar with the policy. Specifically, in 2014 we created our own tool for checking the status of human rights, which we have used globally across the Group to continuously monitor the status of initiatives to address human rights issues. In the fiscal year ended March 31, 2021, we carried out a "check for human rights issues" at 27 sales subsidiaries worldwide, and issued feedback from the secretariat. Looking ahead, we will implement the PDCA cycle at all business sites to improve and strive to strengthen the human rights due diligence of the entire Group.

Supply Chain Management

Basic Approach

Casio procures a wide range of materials from suppliers in Japan, China, and the ASEAN countries. In the event of these domestic and overseas suppliers becoming involved in human rights violations, labor problems, environmental destruction, or other issues, Casio would be exposed to risk that could develop into suspension of transactions with business partners, degradation of the brand image, labor strikes, lawsuits, or other issues. By implementing sustainability initiatives throughout the supply chain, we will not only reduce such social and environmental risks, but also ensure the safe and stable procurement of materials. We therefore believe that it is important for Casio to practice social responsibility through CSR procurement.

Main Initiatives

In order to carry out initiatives throughout the supply chain within a framework of fair and equitable transactions, Casio has established Procurement Policies that address human rights, occupational safety, environmental conservation, and related themes. In order to build a partnership structure with its suppliers, Casio has established Supplier Guidelines and introduced a system for regular monitoring. Specifically, since 2009 suppliers have been requested to complete an annual questionnaire on their practice of corporate social responsibility. In the fiscal year ended March 31, 2021, responses were received from 155 out of 156 contacted suppliers in Japan and from all 299 contacted suppliers overseas (China and Thailand). This questionnaire is designed in a way to better understand the status of suppliers' CSR initiatives. Casio analyzes the results of the questionnaire and uses the results to provide feedback on its approach and vision for CSR procurement. In this manner, we strive for ongoing improvement.

Environment

Basic Approach

Casio has established the Casio Environmental Vision and the Casio Group Environmental Policy with the aim to realize a sustainable global society in the future. Within these, three ideas have been positioned as key issues which need to be solved in the long term: realizing a decarbonized society, realizing a recycling society, and living in harmony with nature. After creating a desirable future vision for each of these ideas, we will look back at how they can be solved, setting interim targets and working together as a Group to achieve the aims.

Realizing a Decarbonized Society

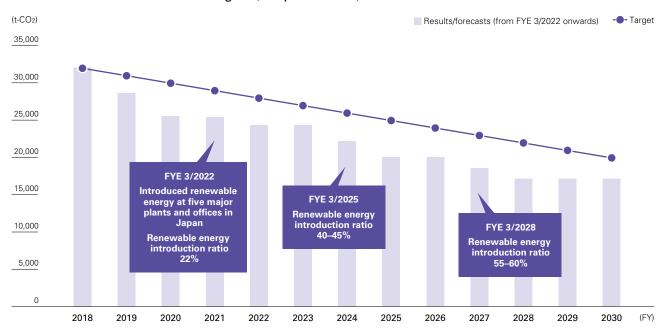
With climate change risks in the spotlight worldwide, Casio will promote even greater energy saving as well as expand its use of renewable energy and secure alternative sources of energy in the value chain.

Regarding greenhouse gas (GHG) emissions from our business activities, we have further increased our reduction target after revising our conventional calculation standards for greater precision. Specifically, we modified

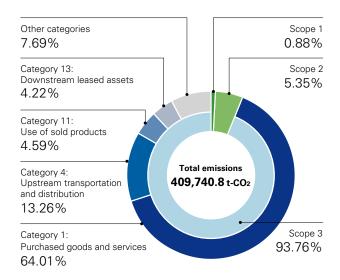
our target for Scope 1 and 2 emissions to "reduce 38% by FYE 3/2031 compared with FYE 3/2019 and achieve virtually zero emissions by FYE 3/2051." To achieve this target, we will now promote the introduction of highly efficient and energy-saving facilities, improvement of operational processes, and use of renewable energy.

In July 2021, we made a move to switch our five major domestic sites over to 100% renewable energy-derived electricity, reducing annual carbon emissions for the Company in Japan by approximately 45%. Since more than 60% of Casio's carbon emissions in the entire value chain are attributed to purchased goods and services (Category 1 of Scope 3), we have launched a survey of our major suppliers on their efforts to reduce GHG emissions. We have increased our reduction target for Scope 3 emissions to reduce GHG emissions from purchased goods and services (Category 1) and use of sold products (Category 11) by 30% by FYE 3/2031 compared to FYE 3/2019. This FYE 3/2031 target has also been certified by SBTi as a goal based on scientific evidence. At the same time, we have also expressed our support for the TCFD and have now started disclosing information.

CO₂ Emissions and Reduction Targets (Scopes 1 and 2)



CO₂ Emissions Across Entire Value Chain



Scope 1 and 2 reduction targets

	Scope 2 calculation method	Scope 1 and 2 total targets			
		Base year	Target year	Target year reduction rate	
Medium-term target	Market-based	2018	2030	38%	
Long-term target	Market-based	2018	2050	100%	

Scope 3 reduction target

Target categories	Base year	Target year	Target year reduction rate
Category 1: Purchased goods and services Category 11: Use of sold products	2018	2030	30%

Realizing a Recycling Society

Casio is working to conserve resources and recycle throughout the value chain. As well as making full use of technologies that achieve smaller, lighter, thinner, and more energy efficient designs, which are core competencies from the development and design stage, we manufacture environmentally friendly products, such as those designed with recycling in mind. Products that meet our own high standards receive certification as Casio Green Star Products or Casio Super Green Star Products.

Additionally, we are working to reduce waste generated at each of our business sites and recycle more of the waste with the goal of completely eliminating waste bound for landfill.

Living in Harmony with Nature

Casio position living in harmony with nature as an important environmental challenge. Based on the Casio Group Biodiversity Guidelines, we are promoting activities aimed at living in harmony with nature, while closely monitoring developments in the business environment and the latest regulations.

Meanwhile, in the Timepiece Business, we are working to produce more products in collaboration with nature conservation organizations from the perspective of living in harmony with nature.

Message from the ESG Officer



The workplace is the basis of our ESG strategy so it's important to promote ESG through concrete practices.

We will accurately understand the expectations and demands of society and the capital market, setting goals and designing strategies from a medium- to long-term perspective to promote and support efforts at each workplace.

YAMAGISHI Toshiyuki

Director, Executive Officer responsible for ESG Strategy

Casio's Approach to ESG

Casio regards ESG initiatives as a key management issue for achieving sustainability for the Company and society. The important thing is to incorporate these initiatives into concrete activities and carry them out. Initiatives are not to be carried out just by the department in charge of ESG and other corporate departments, instead the basis for ESG is the workplace of each business unit and function.

Because of this concept, we have established an ESG management structure with two committees; the Internal Control Committee, which is responsible for Group governance, and the Sustainability Committee*1. Both committees are characterized by having an independent and neutral position between the Board of Directors (oversight function) and the Management Meeting (business execution function), and in coordination with each business, function, and Group companies, they set ESG-related targets and plans, manage progress, and provide all kinds of support. Being responsible for ESG strategy, I am chairman of both committees and have established a structure with ESG at the very heart of Casio's management.

From an ESG management perspective, we see the recently revised Corporate Governance Code and Guidelines for Investor and Company Engagement as a litmus test. Casio has been working to improve and strengthen the functions of the Board of Directors, address sustainability issues, and ensure diversity at the core of our human resources, issues which have been earmarked as key issues for the Company. Needless to say, we will continue to recognize these as key issues, redoubling our efforts on these initiatives.

*1 Established October 2020

Identifying ESG Issues and Promoting Strategies

To promote strategies for ESG-related issues, I place great importance on setting goals and repeating the PDCA cycle. We aligned our relationship with the SDGs in the fiscal year ended March 2020 and proceeded with initiatives for each of our businesses. However, the way in which KPIs were set for each of the different businesses varied. Therefore, as a next step, in April 2021 we aligned the SDGs on a target basis for the roles and function each business needs to fulfill. The breakdown of this is a twofold structure, the first is contributing to social issues with a focus on business, and the second is to reduce our impact on the environment through a functional aspect from a Company-wide perspective. From this structure we are currently resetting KPIs based on a medium-term business plan in anticipation of life after the pandemic.

In considering Casio's ESG issues, as well as contributing to society by maximizing the value we provide, it is crucial for us to identify future risks and opportunities, taking measures to address them. We are also considering a review of our materiality where we feel user needs, technology, human resources, supply chains, information security, human rights and the community, the environment and governance, etc. will all form an important part. For example, as Casio's business is also advancing in software and digitalization, it is imperative we continuously strengthen our information security systems and protect personal information when considering global cyber risks. To safeguard against cyberattack, we will thoroughly implement security-related rules and technical measures across the whole Group. Moreover, in October 2019 we set up a special group, known as the Computer Security Incident Response Team, in order to minimize damage by responding quickly and reliably in the event of an information security breach. As laws and regulations

related to personal information are being tightened in countries across the world, we also established the Section of Overseas Personal Data Protection in March 2021 to promote an internal system to appropriately respond to privacy laws in different countries. We will continue to respond to changes in the internal and external environment, striving to strengthen our system.

Key Issue: Environmental Initiatives

Environmental initiatives are extremely important in Casio's ESG strategy. Casio has been selected in multiple global ESG investment indices*2, etc., but if we delve deeper we see that the social and capital markets are demanding further strengthening in terms of the environment.

Casio has established the Casio Environmental Vision and the Casio Group Environmental Policy in which it sets out three key issues which need to be addressed: realizing a decarbonized society, realizing a recycling society, and living in harmony with nature.

Within these we formulated a medium- to long-term plan as a precursor to realizing a decarbonized society, aiming to reduce GHG emissions to virtually zero by FYE 3/2051 for Scope 1 and 2 emissions, and by 30% by FYE 3/2031 for Scope 3 compared with FYE 3/2019 levels. For Scope 1 and 2 emissions we are looking to achieve our

interim target by FYE 3/2031 by not only using (from July 2021) electricity generated from renewable energy at major sites including at the headquarters and at Hamura and Hachioji, which account for more than one-third of our domestic emissions, but also by planning to use renewable energy-derived power at our mother factory in Yamagata and at overseas sites in Europe and Thailand. The challenge is Scope 3, since although not much emission is produced when using our products due to them being small, thin, light and using little power, it is important for us to reduce emissions in terms of procurement. As such, we will do due diligence on, and strengthen our efforts in collaboration with, our suppliers. In addition to obtaining certification in April 2021 from SBTi for our FYE 3/2031 targets being based on scientific evidence, we plan to join the RE100 initiative, continuing our active collaboration with global initiatives.

Moving forward, we will continue to build a corporate culture in which each and every employee can think and act for themselves so we can create value for society and the environment. It is also my role to bring management closer to the workplace to share ideas on how to solve social issues. In regard to all our stakeholders, I look forward to your guidance and support.

*2 See page 103 for selected ESG indices.

Casio's Targets for the SDGs

Target SDGs	Specific Initiatives	
3 martiness 3.4 	Sports and Health Business Sports Tech Business: Provide individually optimized running experiences Medical Business: Dermo cameras and diagnostic imaging Welfare Solutions Business: Support comprehensive community care with Ayamu, a search site for services not covered by long-term care insurance	
4.4 4.7	Education Business Educational Scientific Calculator Business (GAKUHAN activities): Achieve better mathematics education that meets educational needs in different countries	
5 could be seen to 15.5	New Business • Beauty Tech Business: Nail printer	
9 100273 HANNETS AN HONELEGENE 9.1	Sports and Health Business Welfare Solutions Business: Contributing to an inclusive society by providing a community resource platform in the welfare field with Ayamu	
11 screecids accesses 15	New Business • Imaging Business: Build a social infrastructure where people can live with peace of mind through the imaging module business	

Target	SDGs	Specific Initiatives
12 SEPECES SESSIONS SESSIONS SESSIONS SESSIONS	12.5	Reduce use of resources in all business activities (reduce impact on the environment)
13 court	13.3	Virtually zero CO ₂ emissions by 2050
15 true	15.2 15.3 15.5	Smaller product packaging and online user manuals
17 PROTINSSIPE 1987 THE COURT	17.16	Co-creation with partner companies in new business CO ₂ reductions across the entire supply chain