

# Realizing a Low-Carbon Society

## Approach

### Social Background

Recent times have seen the emergence of global scale problems, including global population growth and an increase in average temperatures around the world. In 2015, the United Nations Sustainable Development Goals (SDGs) and the COP21 Paris Agreement were adopted as stepping stones in solving these problems.

Companies exist in a social context, so it is vital that they face these issues resolutely and take specific steps to help solve them, not only for the present but also to ensure a sustainable life for future generations.

This is why Casio has made “realizing a low-carbon society” one of its material issues and will continue to work to achieve this goal.



### Risks and Opportunities for the Casio Group

As a result of the March 2011 Great East Japan Earthquake and the ensuing accident at the Fukushima nuclear power station, virtually all nuclear power stations across Japan have suspended operations. Japan is faced with such risks as rising electricity tariffs and power shortages in summer and winter. Moreover, the greenhouse gas emission coefficient for electricity has risen as a result of the decline in the utilization of nuclear power generation, resulting in an increase in real CO<sub>2</sub> emissions, which is a challenge when it comes to realizing a low-carbon society. This translates into greater risk of incurring emissions trading costs under the Ordinance on Environmental Preservation to Secure the Health and Safety of the Tokyo Metropolitan Area (Environmental Preservation Ordinance). Also in 2011, there was major flooding in Thailand, which may be partially attributable to global warming and upstream deforestation. Consequently, global risks have become apparent including threats to the value chain for production and parts.

In order to avoid these risks, Casio plans to expand the introduction of renewable energy, and secure alternatives in the value chain.

On the other hand, the greenhouse gas reduction effect at time of product usage offered by Casio products which promote paperless lifestyles, such as data projectors and electronic dictionaries, has been identified as a significant opportunity to address climate change over the product life cycle. Casio will work to further expand its business in these products.

In order to minimize the various risks mentioned above, and expand opportunities, Casio must contribute to the sustainability of the planet and its human societies. Casio recognizes that this is an extremely important issue for further strengthening its business foundation, and will make even more strenuous efforts in the fight against climate change.

## Policy

Casio has set medium and long-term targets for achievement by 2030 and 2050. Casio will put the highest priority on realizing a low-carbon society.

The Casio Group will provide products and services that make an even greater contribution to the reduction and absorption of CO<sub>2</sub> emissions. In addition to expanding products and services that use energy sources that are friendly to people and the planet, including solar, wind, and hydro power, Casio will incorporate these renewable energy sources into its own business operations.

Moreover, the committee working on the material issue of realizing a low carbon society will implement an energy conservation diagnosis at the company's main business sites to identify the potential for CO<sub>2</sub> reductions and formulate a roadmap aimed at carbon reduction as well as share the roadmap with every relevant department to promote all possible measures.

## Management Approach

### Environmental Action Plans and Performance

Evaluation ◎: All targets met, ○: Most targets met, △: Remaining issues outweigh results, ×: No progress made

Medium and long-term targets	FY2018 Target	FY2018 Performance	Evaluation	FY2019 Targets and KPI
<p>Long-term target: Reduce the FY2051 CO<sub>2</sub> emissions (Scope 1 and 2) for the entire Casio Group by 80% compared with FY2014</p> <p>Medium-term target: Reduce the FY2031 CO<sub>2</sub> emissions (Scope 1 and 2) for the entire Casio Group by 26% compared with FY2014</p>	Reduce the FY2018 CO <sub>2</sub> emissions (Scope 1 and 2) for the entire Casio Group by 8.25% compared with FY2014	Achieved a 6.0% reduction	△	Reduce the FY2019 CO <sub>2</sub> emissions (Scope 1 and 2) for the entire Casio Group by 7.95% compared with FY2014

## Activity Results

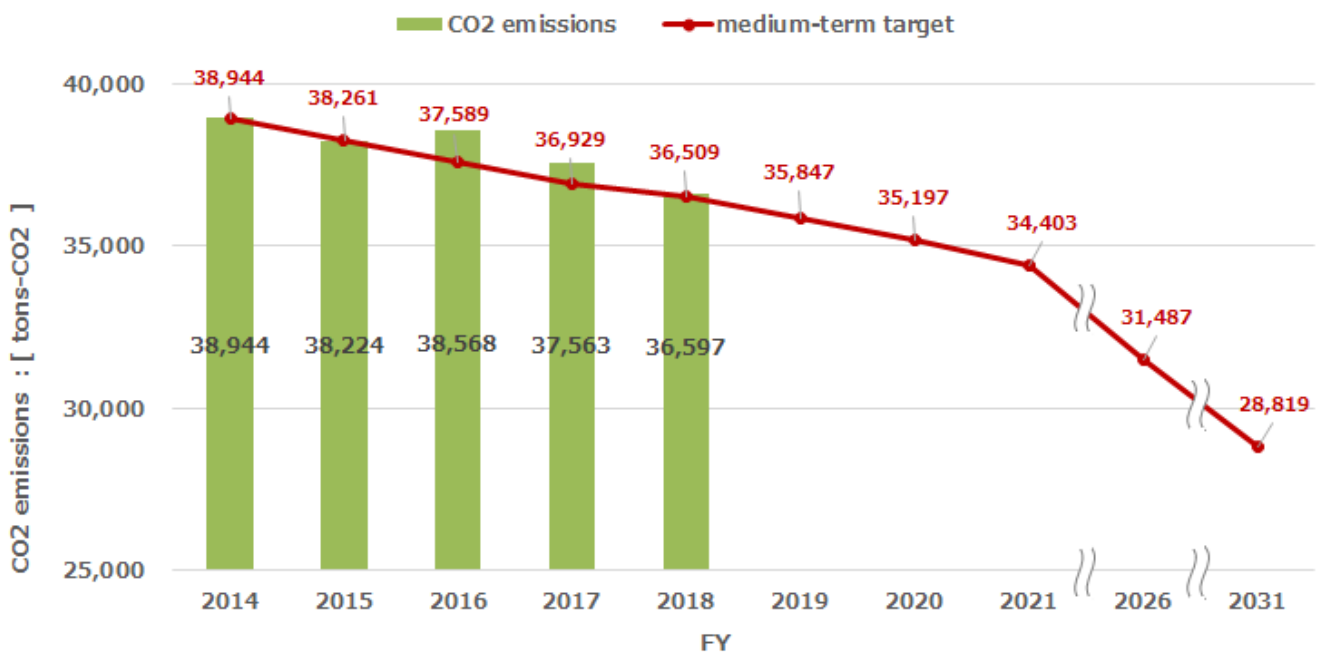
In fiscal 2018, Casio reconsidered its medium- and long-term reduction targets for Scope 1 and 2 greenhouse gas emissions.

In conjunction with this, the company brought the following sites that were not included in the scope of calculations at the time of base year into line with the GHG Protocol and added each of their past GHG emissions to each fiscal year since the base year.

- Casio Electronics (Shaoguan) (a production site purchased from another company in fiscal 2017)
- Small-scale sales office in Japan (not included in scope of calculations up to fiscal 2017, but included in scope from fiscal 2018)

The targets established at the beginning of fiscal 2018 were not achieved, which is partly attributable to the recalculation of base-year greenhouse gas emissions. Compared with the medium-term reduction targets for each fiscal year based on the recalculated base-year emissions, the fiscal 2018 results were close to the medium-term reduction targets. Going forward, Casio will continue to formulate and implement reduction scenarios aimed at achieving the 2030 targets while examining cost effectiveness based on more objective analysis of reduction potential and making the appropriate investment decisions.

### Changes in greenhouse gas emissions (Scope 1 and Scope 2)



(t-CO<sub>2</sub>)

FY		2014 (Base year)	2015	2016	2017	2018	2019	2020	2021	2026	2031
CO <sub>2</sub> emissions		38,944	38,224	38,568	37,563	36,597	-	-	-	-	-
medium-term target	CO <sub>2</sub> emissions	-	38,261	37,589	36,929	36,509	35,847	35,197	34,403	31,487	28,819
	Reduction rate	-	1.76%	3.48%	5.17%	6.25%	7.95%	9.62%	11.66%	19.15%	26.00%

➤ [CO<sub>2</sub> Emissions throughout the Entire Value Chain](#)

## Life Cycle Assessment

In the past, Casio implemented unscheduled life cycle assessment (LCA) for products, but there was no systematic framework for conducting LCA for newly developed products.

In fiscal 2018, Casio brought together members of development departments, distribution departments, IT departments and others for each product to establish an in-house LCA Working Group and commenced studies in order to implement constant product LCA. In the initial fiscal year, the CO<sub>2</sub> impact of the component and material stage in representative models for each item were calculated using the intensity in IDEA version.2.

- Watches: 2.86kg-CO<sub>2</sub>
- Musical instruments: 20.3kg-CO<sub>2</sub>
- Projectors: 12kg-CO<sub>2</sub>
- Digital cameras: 13.4kg-CO<sub>2</sub>
- Electronic dictionaries: 11.1kg-CO<sub>2</sub>

Going forward, Casio will identify issues and formulate a roadmap for the constant implementation of LCAs with the aim of building a system that can perform LCAs for 100% of new models by fiscal 2026.

# Realizing a Low-Carbon Society

## Business Sites Initiatives

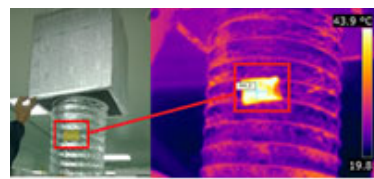
### Initiatives at Casio (Thailand) Co., Ltd.

#### Using insulation to reduce energy use

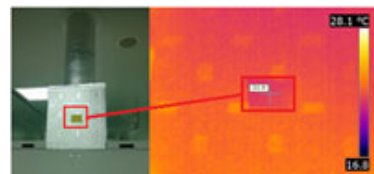
The company reduced the air-conditioning cooling load by installing insulation around the exhaust ports of the reflow system and dryer to block heat conduction. This reduced energy use by 4,651 Kwh per year.



Reflow systems insulation



Before installation  
(surface temperature 44.2°C)



After installation  
(surface temperature 21.9°C)

Surface temperature decreased from 44.2°C to 21.9°C.

## Introducing buses to reduce CO<sub>2</sub> emissions

The company has 40 buses that it provides for employees to use for their daily commute. Around 2,000 employees use these commuting buses. This measure accounts for an annual reduction of CO<sub>2</sub> emissions of 1,567 tons.

Item		Consumption rate (km/L) <sup>*1</sup>	Distance (km) <sup>*2</sup>	Emission coefficient (kg-CO <sub>2</sub> /L) <sup>*3</sup>	Amount <sup>*4</sup>	Days/year	GHG emission (kg-CO <sub>2</sub> /year)	Special notes
Before introduction	Motor cycle (gasoline)	50	60	2.32166	1600 people	268	1,194,633	
	Car (gasoline)	14,763	60	2.32166	400 people	268	1,011,510	
	Total						2,206,143	
After introduction	Bus (diesel)	2.6	60	2.58496	40 units	268	639,479	
Total							1,566,664	Reduction

\*1 Value published by the Ministry of Science and Technology of the Kingdom of Thailand

\*2 Employees' average commuting distance (round trip)

\*3 Based on the Casio Group's calculation standard (emission coefficient from Japan's Act on Promotion of Global Warming Countermeasures)

\*4 The number of people before introduction was calculated as 80% of all employees commuting by motorcycle and 20% commuting by car.



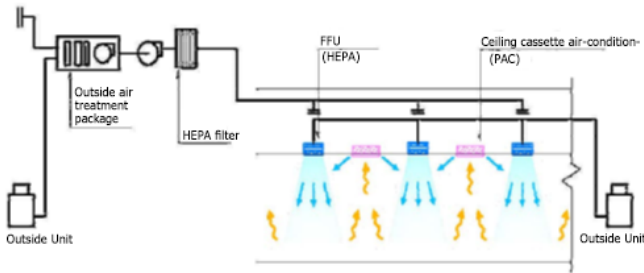
Commuting buses at Casio (Thailand)

## Initiatives at Yamagata Casio Co., Ltd.

### Introducing the latest energy-saving air-conditioning systems

A new watch plant that started operations in May 2018 uses the latest energy-saving air-conditioning systems, such as an air-conditioning system with several air-conditioners with FFUs\*<sup>1</sup> and ceiling cassettes, zoning and separate air-conditioning for clean rooms. These systems enable efficient operation according to the production situation.

\*<sup>1</sup> FFU: Fan-filter unit. A system that passes air sucked in by the fan through a filter to purify it before sending it out as clean air.



Air-conditioning system at Yamagata Casio



Clean room with latest air-conditioning system

## Initiatives at Casio America

Casio America has been carrying out energy-saving measures for many years.

In 2017, it won an ENERGY STAR Award from the U.S. Environmental Protection Agency (EPA).

The award recognized Casio America's efforts to ascertain data on and efficiently manage electricity usage at its data center, and its initiatives to use a building management system to more effectively use cooling and heating. This ENERGY STAR Award was the fourth the company has received, following 2012, 2013 and 2016. Going forward, it will continue to carry out environmentally friendly initiatives to help achieve a sustainable society.



Casio America, Inc.



ENERGY STAR plaque

## Initiatives at Hachioji R&D Center

The Hachioji R&D Center has installed automatic blinds and grows a green wall of vegetation at its facility to reduce CO<sub>2</sub> emissions. The automatic blinds calculate the location of the sun, use sensors to detect the strength of the sunlight, and open and close automatically, thereby reducing the cooling and heating load. Since 2012, the Center has also grown a green wall of vegetation as a summertime energy-saving measure in an effort to reduce the cooling load even more. Through a process of trial and error to balance watering, fertilization, and sunlight, in the summer of 2017, the green wall (planted with two kinds of morning glories) grew splendidly to a size of 8.5 meters wide by 10 meters tall. Local residents even stopped by to take photos of it. This initiative to grow a green wall of vegetation won the first place award out of 36 entries in the “organization grouping” in the “green wall of vegetation category” in the “energy-saving contest” of the Environmental Lecture Presentation and Energy-Saving Contest, which was an event held in December 2017 to commemorate the 100th anniversary of the incorporation of Hachioji as a city.



Green wall of vegetation at the Hachioji R&D Center



Award certificate and first place gift

## Installation of LED Lighting

Casio is installing LED lighting at its business sites to reduce electricity consumption. By March 2018, it had installed LED lighting at the Hatsudai Head Office, Hamura R&D Center, Hachioji R&D Center, Yamagata Casio, Casio Electronics (Shenzhen) Co., Ltd., Casio (Thailand) Co., Ltd., Casio America, Inc., Casio Mexico Marketing, S. de R. L. de C.V., and Casio Electronics (Shaoguan) Co., Ltd., and other sites. The installed LED lighting has brought about substantial CO<sub>2</sub> emissions reductions.



LED lighting in Casio Electronics (Shenzhen)'s lobby



LED lighting in Casio (Thailand)'s plant



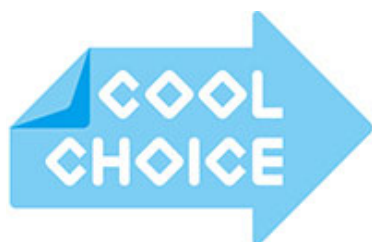
LED lighting in Yamagata Casio's plant



## Participation in Light Down Campaign

Casio supports COOL CHOICE, a national movement promoted by the Japanese government, and the Fun to Share climate change campaign implemented by the Ministry of the Environment. The Group has also been taking part in the Light Down campaign since fiscal 2011.

In fiscal 2019, nine sites at four companies (Casio Computer Co., Ltd. [headquarters, Hamura R&D Center, Hachioji R&D Center, Fukuoka Sales Office, and Higashi-fussa Dormitory], Yamagata Casio [headquarters and Yamanashi Office], Casio Electronics Manufacturing and Casio Techno [Akihabara and Inadaira]) took part in the campaign.



## Reducing Power Consumption through Server Integration

Casio has vastly reduced its energy consumption by integrating the servers that had once been disparately located across the group.

Server integration results: A total of 1,200 servers had been integrated by March 2018.

Effects of reducing power consumption through server integration : A total reduction in power consumption of 1,800,000 kWh, yielding a reduction in CO<sub>2</sub> emissions of 992 tons.

	Through Mar.2017	Apr. 2017 - Mar. 2018	Cumulative total
Number of servers integrated (machines)	1,140	60	1,200
Power consumption reduction (kWh) <sup>*1</sup>	1,710,000	90,000	1,800,000
CO <sub>2</sub> reduction (tons -CO <sub>2</sub> ) <sup>*2</sup>	942.2	49.6	991.8
Number of Japanese cedar trees needed to absorb this amount <sup>*3</sup>	67,301	3,542	70,843

<sup>\*1</sup> Calculated based on a 1,500 kWh reduction per server per year.

<sup>\*2</sup> Calculated based on CO<sub>2</sub> emissions of 0.551kg kg/kWh.

Figures for past fiscal years have been recalculated using the GHG Protocol Calculation Tools.

<sup>\*3</sup> Based on a document published by the Forest Agency of Japan's Ministry of the Environment, "Absorption Source Countermeasures for Greenery to Prevent Global Warming," indicating that a single Japanese cedar tree absorbs about 14 kg of CO<sub>2</sub> annually.

# Realizing a Low-Carbon Society

## Logistics process initiatives

Casio is actively reducing its environmental impact by striving to reduce CO<sub>2</sub> and waste emissions arising from logistics. In order to reduce CO<sub>2</sub> emissions in the logistics process, Casio is promoting the following three action plans.

- *Shortening transport distances* : Promoting direct shipping to customers from logistics centers in and outside Japan
- *Promoting a modal shift* : Actively using modes of transport with low environmental impact such as rail for transport between sites
- *Improving loading efficiency and reducing transport volume* : Improving the packaging design of electronic dictionaries, musical instruments electronic cash registers, and other products, and reducing the volume of packaging

### Relocation and Consolidation of Logistics Centers in Japan

Casio's logistics center in Mie Prefecture was moved to Saitama Prefecture, and then its distribution center in Tokyo was ultimately consolidated with the logistics center, a transition that was achieved in stages.

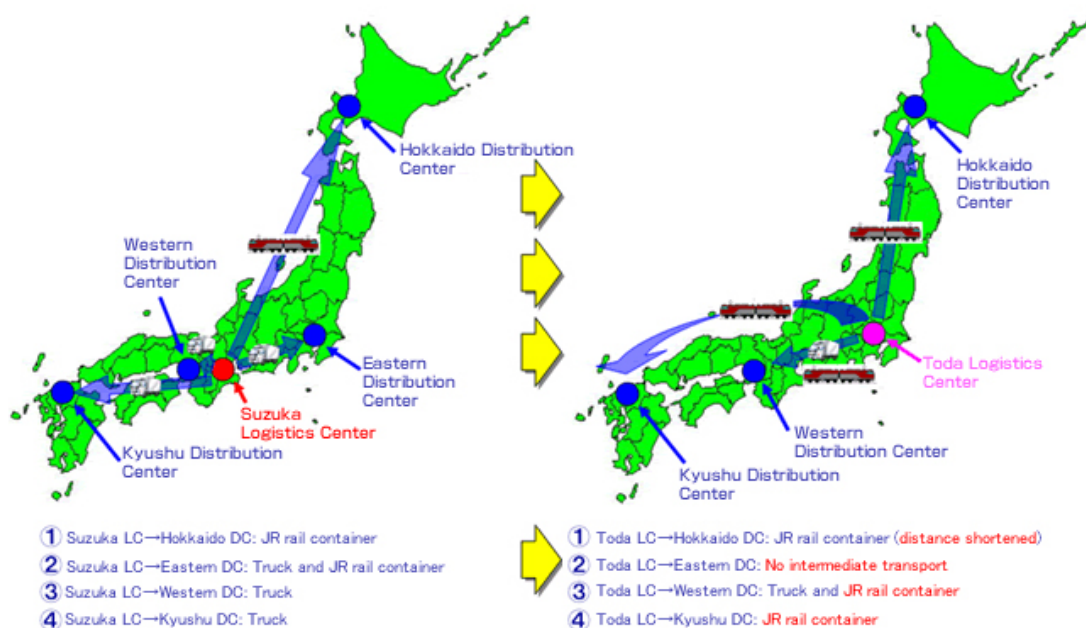
In August 2011, the logistics center was moved from Suzuka City, Mie Prefecture, to Toda City, Saitama Prefecture.

Then in January 2012, the company's Eastern Distribution Center in Koto-ku, Tokyo, was consolidated with the logistics center.

With this change, Casio reduced the number of consumer product distribution sites in Japan from five to four. This transition not only shortened transport distances, but also promoted a significant shift from truck to rail shipment, and has contributed greatly to CO<sub>2</sub> emissions reduction.

### Promoting Modal Shift and Reducing Intermediate Transport

#### ◎ Promoting Modal Shift and Reducing Intermediate Transport



## Results of the Transfer and Consolidation

### 1. Elimination of intermediate transport

Shortened the distance from the logistics center to the Hokkaido Distribution Center in Sapporo

Intermediate transport no longer required from the logistics center to the Eastern Distribution Center in Tokyo

### 2. Promotion of modal shift

Partial shift to rail between the logistics center and the Western Distribution Center in Osaka

Switch to rail between the logistics center and the Kyushu Distribution Center in Fukuoka

### 3. Transport distance shortened

Shortened the transport distance in the Kanto (Tokyo) region which accounts for about 46% of direct shipments from the logistics center (delivery direct to customers without going through a distribution center)

\* As a result of the efforts above, annual CO<sub>2</sub> emissions were reduced by about 216 tons.

In fiscal 2013, Casio began an initiative to send products manufactured outside Japan directly to the Western Distribution Center in Osaka.

This allows transport distances to be shortened significantly by cutting out transit through the Toda Logistics Center.

## Introduction of reusable shipping cartons in Asian distribution

Introduction of reusable shipping cartons in Asian distribution

In an effort to switch to plastic reusable shipping cartons in its air freight shipments between Japan, Hong Kong, and Thailand, Casio launched the use of new cartons in September 2009.

These cartons can be used to ship parts made in Japan to Hong Kong for use at Chinese production sites, and to ship timepiece parts from vendors in China, from Hong Kong to Thailand. By then transporting finished timepieces or timepiece parts from Thailand to Japan, the cartons never have to travel empty between the three countries.

Unlike traditional cardboard boxes, these cartons do not have to be discarded, and instead can be used many times over, thereby reducing environmental impact.



A reusable shipping carton employed for distribution in Asia

Casio has now begun to introduce even larger shipping cartons. The large shipping cartons are mainly used for ocean transport. Packaging damage can be avoided through the use of LCL shipping (freight from different companies in one ocean shipping container), which also eliminates the need to use air transport when the shipping volume is small. Casio has been using these large shipping cartons to ship products since fiscal 2012, and in fiscal 2014 new shipping cartons with even greater strength were added to the lineup of shipping supplies.



Shipping carton receives Chairman of Japan External Trade Organization (JETRO) Award

On October 4, 2012, the large shipping carton shown here received the Chairman of Japan External Trade Organization (JETRO) Award at the Japan Packaging Contest 2012, one of Japan's biggest packaging competitions, which is organized by Japan Packaging Institute.

#### Four products obtain Eco Rail Mark certification

On February 28, 2013, Casio obtained Eco Rail Mark certification from the Railway Freight Association for four products: clocks, digital pianos, electronic keyboards and electronic cash registers.

The Eco Rail Mark indicates that a product or company is proactively addressing global environmental issues by using rail freight transport. Rail transport produces about one sixth of the CO<sub>2</sub> emissions of commercial trucking, making it an environmentally friendly method of transport with a low environmental impact.

The criteria for certification are utilization of rail for at least 30% of land freight transport for distances of 500km or more for a product, and utilization of rail for at least 15% of land freight transport for distances of 500km or more for a company.

Casio obtained Eco Rail Mark certification as a company in October 2009 and successfully obtained product certification as a result of further expanding rail transport due to the relocation, amalgamation and closure of business sites.

Casio now actively uses rail for transport from its logistics center in Saitama Prefecture to distribution centers in Hokkaido, Osaka and Fukuoka. Going forward, Casio will make active efforts to reduce environmental impact by pursuing environmentally friendly transport.



Eco Rail Mark



Promoting a modal shift to rail transport



Environmentally friendly rail containers