

# Offices

All Casio office sites are engaged in efforts to reduce CO2 emissions and cut resource use by upgrading office equipment and improving work processes.

## 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 1,020 servers had been integrated by March 2015.

### Effects of reducing power consumption through server integration

This server integration effort resulted in a total reduction in power consumption of 1,530,000 kWh, yielding a reduction in CO2 emissions of 555 tons.

#### Contributing to Green IT Through Server Integration

	Through Mar. 2014	Apr. 2014 - Mar. 2015	Cumulative total
Number of servers integrated (machines)	970	50	1,020
Annual power consumption reduction (kWh)*1	1,455,000	75,000	1,530,000
Annual CO2 reduction (tons-CO2)*2	528.2	27.2	555.4
Number of Japanese cedars needed to absorb this amount (trees)*3	37,700	1,900	39,600

\*1: Calculated based on a 1,500 kWh reduction per server per year.

\*2: Calculated based on CO2 emissions of 0.363 kg/kWh. From Japan's Ministry of Internal Affairs and Communications, "Report by the Study Group on ICT Policy for Addressing Global Warming," April 2008.

\*3: 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 CO2 annually.

## Initiatives at Casio America

Casio America has been carrying out various environmental initiatives over many years. These include sorted collection of bottles and cans, collecting and taking out used paper and cardboard for recycling, using recycled materials for individual watch packaging and display stands, replacing old energy-inefficient personal computers, and providing employees with reusable drink bottles to reduce the need for paper cups.

These activities have been recognized by the Morris County Municipal Utilities Authority (MCMUA), which promotes environmental protection by presenting awards to companies for their green endeavors.



Individual watch package and display stand made from recycled materials

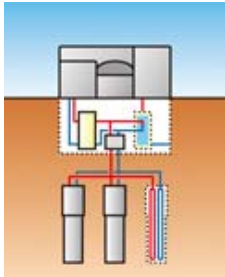


## Casio Europe's energy-efficient building

Casio's office sites have shifted from focusing on reducing CO<sub>2</sub> per unit of production to cutting the total volume of CO<sub>2</sub> emitted across the entire Casio Group. In January 2009, Casio Europe integrated its offices, distribution center, and service center, which had previously been separately located around Germany, into a new energy-efficient building.



CASIO Europe



Geothermal heat usage model

This building has an innovative air conditioning system that uses Geothermal heat collecting equipment 130m below ground to pump water through pipes embedded in the concrete ceiling and floor of the building. The system pumps cool water in the summer and hot water in the winter to either cool or heat the building. Energy consumption in the building is further reduced by controlling room temperatures using blinds that open and close automatically according to the weather as well as proper ventilation.

## Hachioji R&D Center takes on the challenge of climate change and environmental preservation

The Hachioji R&D Center was designed and constructed to reduce CO<sub>2</sub> emissions in order to contribute to the fight against climate change. The center continues to take on the challenge of environment protection. Some of its innovations are highlighted below.

### Ongoing power-saving activities

The Hachioji R&D Center completed in November 2003 is a research and development facility that incorporated environmentally friendly equipment from the initial design stage. It has been running efficiently for approximately 12 years since it opened, boasting energy-saving features such as high-efficiency vertical thermal storage tanks, a natural ventilation system, automatic blinds, lighting control and equipment control based on weather forecasting. Thus, instead of just relying on its hardware, the center has been enthusiastically pursuing other improvements such as finely tuned temperature control adjustments, and the revision of operation methods based on actual daily data. In fiscal 2013, interior lighting fixtures started being converted from fluorescent to LED, as part of effort to reduce energy consumption.

As a result of these efforts, in fiscal 2010, five years after the base year of fiscal 2005, the center was able to reduce CO<sub>2</sub> emissions by 27.5%. Subsequently, the organization and the number of employees at the center underwent significant changes in fiscal 2011 and fiscal 2012, and substantial changes in singular values were also observed in the amount of CO<sub>2</sub> emissions. However, in fiscal 2015, CO<sub>2</sub> emissions were less than half of what they were in the base year of fiscal 2005.

	Base year emissions (FY2005)	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Emissions (tons)	2,952	2,140	705	961	1,319	1,272	1,306
Reduction rate compared to the base year		28%	76%	67%	55%	57%	56%

Figures reported up to fiscal 2010 differ due to a change in the CO<sub>2</sub> emissions calculation method

In fiscal 2015, CO<sub>2</sub> emissions rose slightly over the previous year despite a reduction in energy consumption. This was due to a deterioration of the power conversion coefficient used to calculate CO<sub>2</sub> emissions.

### Natural ventilation system maximizes use of outside weather conditions

No heating equipment is needed at the Hachioji R&D Center. This is because the building has comprehensive thermal insulation, which prevents interior heat from escaping to improve thermal efficiency. Since room temperatures increase even in winter, due to body heat and

heat from equipment such as computers, the interior is cooled by letting outside air in as needed through ducts on each floor. This provides ventilation through natural airflow using the chimney effect to lower room temperatures. Thus, the temperature is adjusted using hardly any electric power.

### Making the most of sunlight with automatic blinds

The opening and closing of the blinds is controlled automatically by calculating the position of the sun and using sensors to detect its intensity at the same time. Thanks to this technology, a comfortable interior environment is maintained. In addition to this, the system reduces unnecessary usage of electricity by regulating air conditioning to match the number of people in the center obtained by using building entry data and automatically control interior lighting, switching it on and off and adjusting brightness with sensors that detect room brightness and human movement. The building also has a green wall of vegetation to prevent it from heating up. The center has developed educational tours for local elementary school students and others to explain the use of its features.

Related materials: See the “Environmental Communication” section for information about educational tours of the facility

<http://world.casio.com/csr/env/communication/>

Through these measures, the Hachioji R&D Center is contributing greatly to the reduction of CO<sub>2</sub> emissions, thereby helping in the fight against climate change and protecting the environment. While fully utilizing the environmentally friendly functions of this energy-saving building, the center is implementing cycles of improvement, operation, results, verification, and evaluation in order to achieve even more power savings in the future.



**Automatic blinds**

The automatic blinds help to maintain optimal interior temperatures and lighting through automatic control of natural light. They block the intense summer sun. In addition, employees came up with the idea of saving more electricity by opening the blinds at lunchtime to let light in and turning off the lights.



Every spring since 2012, a green wall of vegetation has been grown on part of the building exterior. In the summer it partially shields the surface of the building and the interior from direct sunlight to prevent increases in temperature.



In 2014, bitter melon, melon, and Ryukyu morning glory were planted for the green wall. The climbing plants reached and covered the second-floor windows of the Hachioji General Affairs Section.

## Installation of LED lighting

Through the active adoption of LED technology within the Casio Group, energy consumption for lighting has been greatly reduced. As of March 2015, about 4,000 LED fixtures have been installed, saving about 80 kWh per year compared to conventional fluorescent lamps.



LED lighting in the lobby of the Hatsudai headquarters



LED lighting in the Hamura R&D Center lobby

## Participation in Light Down Japan 2014

In support of the global warming prevention efforts being implemented by the Ministry of the Environment, Casio has been participating in the Team Minus 6% initiative, Challenge 25 Campaign and Fun to Share Campaign.

In fiscal 2015, five Casio sites also participated in Light Down Japan 2014, which calls for lights to be turned off on the day of the summer solstice and the day of the Tanabata (Star) Festival.

(Casio Computer Co., Ltd.: Headquarters, Hamura R&D Center, Hachioji R&D Center, Yamagata Casio, and Casio Electronics Manufacturing)

Lights were turned off for a total of six hours on each of two days at five sites, reducing electricity consumption by 1,140.8 kWh.