Material Balance

The material balance represents an environmental assessment of Casio's energy-saving and resource-saving manufacturing practices. Casio is always striving to minimize its energy and resource inputs as well as its emissions and outputs.

What is a Material Balance?

A material balance provides an overall picture of a company's environmental impact. It shows the amount of energy and resources a company uses in its business activities (inputs into business activities), the amount of environmentally harmful substances (including waste) it emits, and the amount of output it produces and sells (outputs from its business activities).

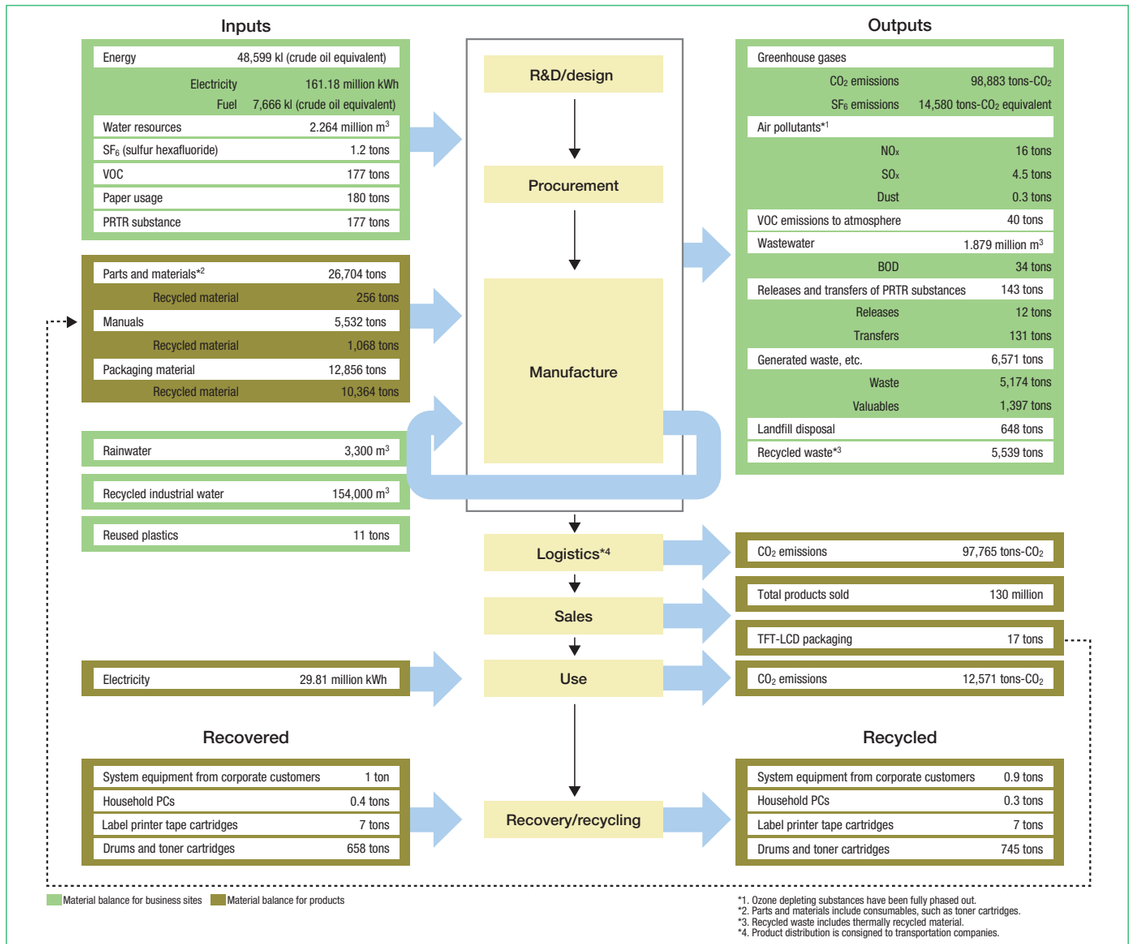
Fiscal 2009 Performance

Casio's fiscal 2009 material balance showed reduction in both inputs and outputs, including a major decline in CO_2 emissions of 29,890 tons.

This is primarily attributed to a reduction in inputs resulting from downward adjustments to production caused by the economic slowdown, as well as the transfer of Casio's electronic component plants in Japan to a third party. As a result, the material balance per unit worsened for Casio's operations outside Japan, but improved for its operations in Japan.

Going forward, Casio will continue to position greenhouse gas reduction as a priority environmental issue.

Material balance in business activities (fiscal 2009)



*1. Ozone depleting substances have been fully phased out.
*2. Parts and materials include consumables, such as toner cartridges.
*3. Recycled waste includes thermally recycled material.
*4. Product distribution is consigned to transportation companies.

References p5. Material Balance (Electronics Segment)
p6. Material Balance (Electronic Components Segment)

Environmental Performance

The best way to reduce environmental impact is to make daily improvements. Clean water, fresh air, and the beauty of greenery are all gifts we receive from the earth. Casio believes every day should involve some kind of effort to give something back to the earth. The care with which this is done is the measure of Casio's environmental performance.

Reducing CO_2 Emissions: Fiscal 2009 Results and Analysis

In the first year of the period covered by Casio's Environmental Action Plan (five years), efforts made at its Japanese sites resulted in a reduction accounting for 42% of its production site target (35% reduction in CO_2 emissions per unit of actual production compared to fiscal 1991) and a reduction accounting for 16% of its office target (9% total reduction compared to fiscal 1991).

Casio was able to fulfill its first-year commitment to the goals established by Japan's four electrical and electronics industry associations for meeting the Kyoto Protocol, which was ratified by Japan. This was made possible in part by the accumulation of energy-saving measures already implemented. Also, although there were concerns about a per-unit worsening due to downward adjustments to production in fiscal 2009, this was prevented by the transfer of Casio's electronic component plants in Japan to a third party, a move that reduced CO_2 emissions by about 20,000 tons-CO_2.

On the other hand, the Environmental Action Plan target year for outside Japan is fiscal 2013, and fiscal 2009 performance showed a 24% per-unit increase against the production site target (30% reduction in CO_2 emissions per unit of production compared to fiscal 2005) and a 27% increase against the target for office sites (3% total reduction compared to fiscal 2005).

At production sites outside Japan, total CO_2 emissions were reduced by 4,529 tons-CO_2 compared to the previous fiscal year. This is attributed to a change made at production sites about two years ago, whereby electronic component production was shifted in-house, as well as to downward adjustments to production resulting from the economic slowdown. In terms of office sites, meanwhile, there has been a net increase of six additional office sites that did not exist in the base year of fiscal 2005, including the addition of three new group sales companies in fiscal 2009.

Reducing CO_2 Emissions: Future

Casio made energy-saving investments in heating systems for production sites in Japan, which were to be its leading energy-saving efforts for fiscal 2009, and the system went online by the end of the fiscal year. The energy savings are to be achieved by adopting a heating system that replaces absorption chillers, which use heavy fuel oil A, with turbo chillers that run on electricity.

Converted into CO_2 emissions, this has the potential to result in an annual reduction of 5,000 tons-CO_2, which will have a significant impact going forward.

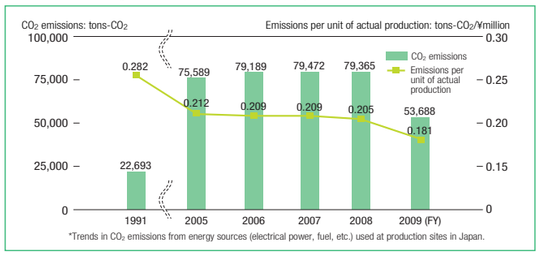
Even at Casio's office sites, the shift to energy-efficient lighting is gradually being made. However, since there are plans to incorporate many of Casio's office sites in Japan (including sales offices and others)—which are currently tenants in buildings operated by other companies—into its Action Plan, the total rate of reduction for office sites is expected to decline. This will make additional measures necessary.

Reporting now on office sites outside Japan, Casio has built a new energy-efficient building for Casio Europe, a leading sales and distribution center, and was doing business there by the end of fiscal 2009. Energy-saving improvements include the installation of a new air conditioning system that heats water and rooms using geothermal heat in the winter, and cools rooms during the summer by circulating water through pipes embedded in the walls and floors of the building. This system is capable of achieving a 30% to 45% reduction in CO_2 emissions over conventional systems, and is therefore expected to yield significant results in fiscal 2010 and beyond.

Important steps are also being taken at production sites outside Japan. Casio (Thailand) Co., Ltd., is starting to use company vehicles that have been converted from gasoline to compressed natural gas (CNG).

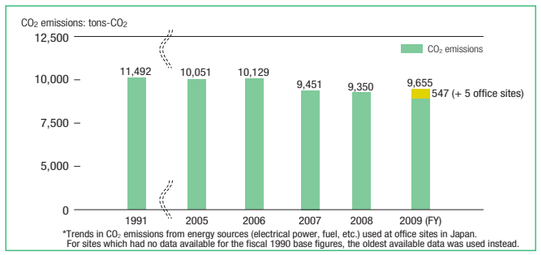
Casio will continue to analyze current conditions and reexamine future targets, and will take specific steps for achieving them.

CO_2 emissions (production sites in Japan)



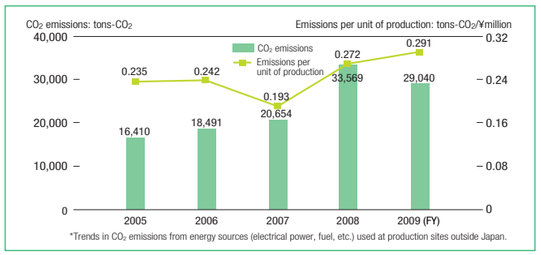
*Trends in CO_2 emissions from energy sources (electrical power, fuel, etc.) used at production sites in Japan.

CO_2 emissions (office sites in Japan)



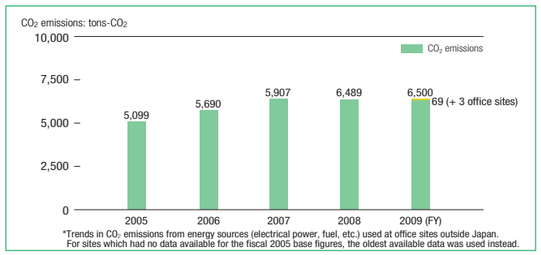
*Trends in CO_2 emissions from energy sources (electrical power, fuel, etc.) used at office sites in Japan.
For sites which had no data available for the fiscal 1990 base figures, the oldest available data was used instead.

CO_2 emissions (production sites outside Japan)



*Trends in CO_2 emissions from energy sources (electrical power, fuel, etc.) used at production sites outside Japan.

CO_2 emissions (office sites outside Japan)



*Trends in CO_2 emissions from energy sources (electrical power, fuel, etc.) used at office sites outside Japan.
For sites which had no data available for the fiscal 2005 base figures, the oldest available data was used instead.

References p7. CO_2 Emissions (Electronics and Electronic Components Segments)

Reducing Waste

The target years for meeting waste reduction goals were set to fiscal 2009 in Japan and fiscal 2013 outside Japan. Fiscal 2009 results show that Casio achieved a 42% reduction in waste, as compared with its target of reducing waste at all sites per unit of actual production by 40% compared to fiscal 2001. This represents a 2,174-ton reduction over the previous fiscal year.

This was achieved in part due to an approximately 1,900-ton reduction resulting from the transfer of Casio's electronic component plant in Japan to a third party early in the period, as well as by downward adjustments to production. The total volume of landfill disposal at all sites in Japan (production sites and office sites) increased by about 11 tons because of the new application of environmental assessments at five Japanese sales sites that acquired ISO14001 certification. Many of Casio's sales sites are tenants in buildings owned by other companies, and finding ways to ensure improvement at those sites will be an important issue. Casio plans to incorporate all of its sales sites in Japan into its environmental assessment plans, and is studying various measures for controlling increases in landfill disposal.

Meanwhile, Casio reported a 3.6% increase in waste at its sites outside Japan, versus its target of reducing waste at production sites outside Japan per unit of production by 30% from fiscal 2005. Still, this represents a reduction of 126 tons from the previous fiscal year.

This shift is attributed to the downward adjustments in production as well as the decline in production values caused by unit price decreases. Casio's office sites outside Japan achieved a 266-ton reduction in total waste output from the previous year. In coming months, Casio will examine additional measures that can be taken to achieve its targets by the target year (fiscal 2013).

Reducing Usage of Water Resources

The target years for meeting water use reduction goals were set to fiscal 2009 in Japan and fiscal 2013 outside Japan. Fiscal 2009 results show that Casio achieved a 20.5% reduction in water usage at its production sites in Japan, exceeding its target of a 10% reduction in water usage per unit of actual production compared with fiscal 2001. This represents a reduction of 860,000 m^3 from the previous fiscal year. As was the case with its waste reduction achievements, this is attributed to the transfer of Casio's electronic component plant in Japan to a third party, which yielded a water usage reduction of about 950,000 m^3.

Casio Electronic Manufacturing Co., Ltd., began reusing rainwater in fiscal 2008, and the volume reused rose from 2,000 m^3 to 3,300 m^3 in fiscal 2009. The total water usage at office sites in Japan was about 130,000 m^3, but at sites which rent office space, including sites outside Japan, water usage is often incorporated into the rent package, making it difficult to assess total water usage. At its production sites outside Japan, Casio reduced its water usage by about 20%, outperforming its target of reducing water usage per unit of production by 15% compared to fiscal 2005. This represents a reduction of 70,000 m^3 from the previous fiscal year. This is attributed in part to downward adjustments in production, but also reflects the impact of gradual increases in the use of recycled water made possible by wastewater purification equipment, water-saving measures such as strengthening periodic water leak inspections and tightening water volume valves, and measures to educate employees about water conservation.

Going forward, Casio will study measures to achieve further reductions, starting with its sites in Japan, which accounted for about 86% of its total water resource usage of 2.26 million m^3.

Reducing Usage of Paper Resources

Casio's target for paper usage was to reduce the amount of paper used at all sites in Japan by 30% per unit of actual production by fiscal 2009, compared with fiscal 2004. Fiscal 2009 results in Japan revealed a 37.5% increase in paper usage, leaving the target unmet, but still representing a total decrease of about 4 tons from the previous fiscal year. This is attributed to the addition of 16 office sites now being evaluated, even though the number of production sites has remained unchanged since the base year of fiscal 2004. To ensure the effective use of resources and prevent global warming, the use of paper, which is made from trees, must be reduced. Casio is therefore resetting its targets based on fiscal 2008 levels. Casio will also continue striving to reduce its paper usage by promoting "Green IT" initiatives.

Reducing PRTR Substances

The reduction target for chemical substances regulated by Japan's Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Act) is to achieve a 40% reduction per unit of actual production compared to fiscal 2004 levels, by fiscal 2013. Casio had achieved a 61% reduction by fiscal 2009, reflecting a total reduction of four tons from the previous fiscal year. This is attributed to the replacement of 2-ethoxyethyl acetate. The transfer of Casio's electronic component plant in Japan was completed in fiscal 2009, but since the replacement of PRTR substances in the plant had already been completed in fiscal 2007, this did not contribute to the year-on-year total volume reduction. The replacement of 2-ethoxyethyl acetate with another substance was completed in fiscal 2009. Casio will continue working toward current targets until the new products from its materials suppliers (using substitute materials) yield positive results.

Reducing VOCs

Casio set the target year for reducing its atmospheric emissions of volatile organic compounds (VOCs) to fiscal 2011. Its fiscal 2009 results show that it has achieved a 16% reduction, making good progress on the target of reducing total emissions by 30% compared to fiscal 2001 for all production sites in Japan. This represents a reduction of 4 tons from the previous fiscal year. This year, Casio plans to decide on replacing these with substitute materials or introducing air scrubbing equipment.

Reducing NO_x, SO_x, and Dust

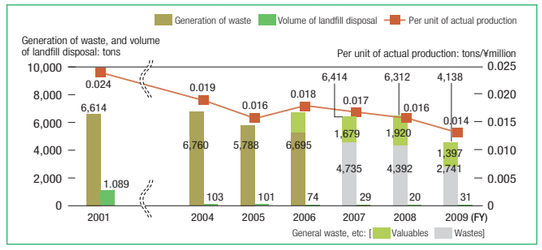
Casio's atmospheric emissions of nitrogen oxides (NOx), sulfur oxides (SOx) and dust in the peak year of fiscal 2006 were 138 tons, 37 tons, and 2 tons, respectively. Emissions in fiscal 2009 were 16 tons, 4.5 tons, and 0.3 tons, respectively. These dramatic reductions are attributed to the shift from heavy fuel oil A to natural gas and electricity, and Casio will continue to strive to reduce its use of heavy fuel oil A.

Reducing SF_6

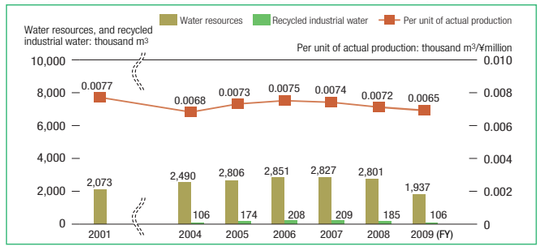
Casio has set a target of reducing its SF_6 emissions to less than 148% increase of 18,021 tons-CO_2.* This was attributed to an increase in production volumes, and to the fact that, since the final stages of efforts to investigate SF_6 reduction measures took place during fiscal 2009, the results reflected emissions before countermeasures were put into place. Casio is investigating measures to reduce SF_6 so that it can make final determinations regarding quality, cost, and schedule, based on production, including whether to use substitute substances or to introduce air scrubbing equipment, and is promoting efforts to achieve the established targets.

*The targets here indicate calendar years, while other performance figures are based on fiscal years.

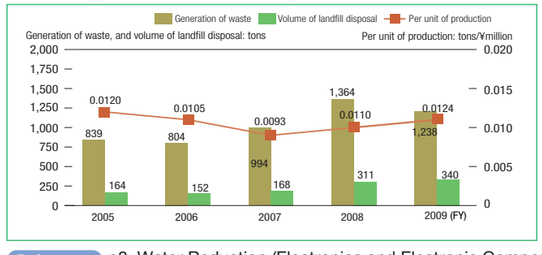
Generation of waste, volume of landfill disposal, and waste per unit of actual production (all sites in Japan)



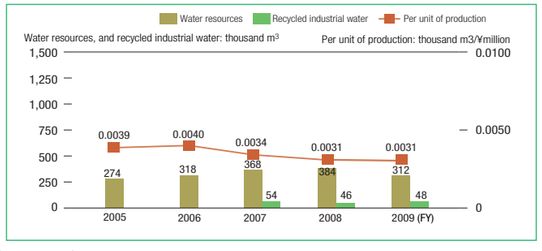
Usage of water resources and recycled industrial water, and input per unit of actual production (Japan production sites)



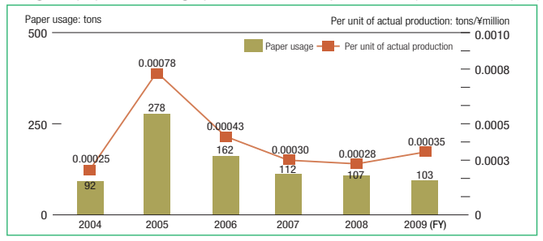
Generation of waste, volume of landfill disposal, and waste per unit of production (production sites outside Japan)



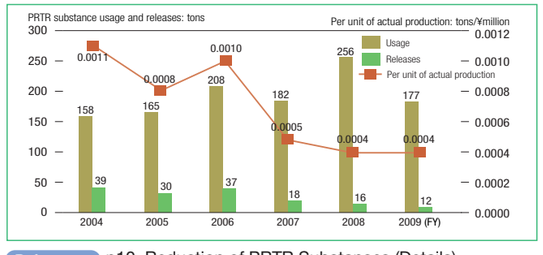
Usage of water resources and recycled industrial water, and usage per unit of production (production sites outside Japan)



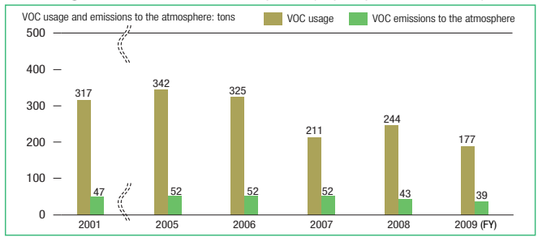
Usage of paper and usage per unit of actual production (all sites in Japan)



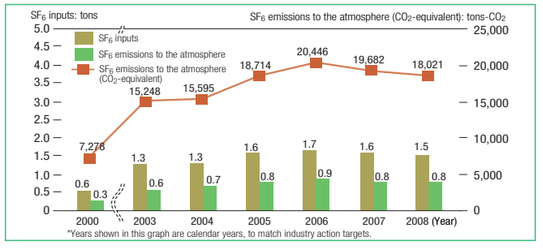
PRTR substance usage, releases, and releases per unit of actual production (Japan production sites)



VOC usage and emissions to atmosphere (Japan production sites)



SF_6 gas usage and emissions to atmosphere (Japan production sites)



References p8. Water Reduction (Electronics and Electronic Components Segments)
p9. Water Usage Reduction (Electronics and Electronic Components Segments)

References p10. Reduction of PRTR Substances (Details)
p11. Reduction of VOCs / Reduction of NOx, SOx, and Dust