From Eco-product Design to Next-generation Eco-product Design

Casio is moving from conventional eco-product designs to next-generation eco-product designs that broaden design considerations to cover an array of issues, including the problem of resource depletion.

R&D to Find Alternatives for the Rare Metal Indium

Developing transparent conductive film material

Indium tin oxide (ITO), a transparent oxide film made of indium and tin, is used as a transparent conductive film material in LCDs.

Indium is a rare metal whose production is very limited and whose reserves are unevenly distributed. For this reason, there are worries over its depletion and concerns about stable supplies, making the development of alternative technologies to ITO transparent conductive film material a subject of importance to various nations.

Zinc oxide (ZnO) is gaining attention as an alternative transparent electrode material to ITO.

Specifically, Casio is conducting R&D to realize the application of a ZnO film as a transparent electrode material in LCDs and other products. The ZnO film, developed by Professor Tetsuya Yamamoto of the Kochi University of Technology, boasts a high transmission rate and fast deposition. In addition to its application as a transparent electrode film, this ZnO material has potential applications in various semiconductor devices as a compound semiconductor material. R&D on its applications in ultraviolet light emitting diodes (LED) and solar cells is also being conducted in a government-related "Collaboration of Regional Entities for the Advancement of Technological Excellence." Casio Computer Co., Ltd., and Kochi Casio are participating in this project, focusing on the R&D of applications for this new ZnO transparent conductive film in LCDs.

* See page 28 for a "Links between research themes."

Sustainable technologies

In addition to slowing the depletion of global resources, the R&D of alternative materials to replace rare metals represents the pursuit of sustainable technology that will ensure resources for future generations and help maintain biodiversity.

New alternative materials have significant hidden possibilities as raw materials suited for energy- and resource-efficient industry, in that they could potentially improve the device manufacturing process and simplify manufacturing equipment.

Casio sees this R&D as a highly advanced effort to secure and effectively utilize rare resources at the far upstream end of the supply chain.

From Green Products to Next-generation Green Products

Casio assesses all of its products against its own Green Product Development Guidelines at each stage of planning and design. Products that meet the environmental design and eco-product criteria are approved and certified as Casio Green Products.

Next-Generation Casio Green Products

Casio's target for the percentage of Casio Green Products in total sales was to reach 70% by fiscal 2008, but the group hit 70.5% early in fiscal 2007. Casio has thus set itself the mid-term goal of developing "Next-Generation Casio Green Products" by expanding the scope and number of assessment items and formulating new standards that add the following criteria to the existing guidelines.

1. Employs sustainable technology.
2. Meets top level standards.
3. Leads green marketing.

Making the Most of LCA

Casio sees life cycle assessment (LCA) as an important tool. LCA is excellent for identifying potential ways to reduce environmental impact at each stage of the product life cycle—including procurement of raw materials, manufacturing, distribution, use, disposal, and recycling. LCA also helps to ensure the accountability of improvement efforts. Its downside, however, is being time-intensive. Casio pursues efficiency by using the best LCA assessment method for each different purpose.

ISO type III environmental labeling

One of Casio's data projectors has acquired the Eco-leaf Environmental Label granted by the Japan Environmental Management Association for Industry. The Label program is highly objective and enables comparisons of products within the same category.

Eco-leaf Environmental Label

LCA in product environmental assessments

Casio has adopted the LCA method to evaluate the environmental impact of cellular phones. During the LCA, it conducts assessments specific to raw material procurement, product use, disposal, and recycling, evaluating improvement compared to products in the same category. Going forward, Casio will expand the scope of products assessed.