Innovation for Sustainability

True to its DNA, Sony continues to address the challenge of realizing new potential through creative technologies, products and services and a spirit of innovation that focuses on contributing to society. This challenge is undertaken in partnership with a diverse array of stakeholders.

Technology ›

Sony harnesses new technologies to contribute to the realization of sustainable lifestyles and address key issues of importance to society.

More

Solution ›

In addition to taking steps to lower greenhouse gas emissions from its operations, Sony is developing energy-saving products and IT technologies that help reduce CO_2 emissions from Sony products during use by customers.

More

Marketing ›

Sony offers programs that enable consumers to make their own contribution toward solving environmental problems.

More

Design ›

Sony pursues a variety of design-based initiatives that help solve problems faced by society and take user diversity into consideration.

More

Innovation for Sustainability

Technology

Expanding from the Development of Olivine-Type Lithium-Ion Iron Phosphate Storage Batteries to Include Other Peripheral Devices

Development of olivine-type lithium-ion iron phosphate secondary batteries that provides a long lifespan, a high level of safety and a smaller environmental footprint

Since commercializing the world's first lithium-ion battery in 1991, Sony has continued to focus efforts on the development and commercialization of technologies for lithium-ion batteries, which boast excellent energy efficiency and high energy/power density, among other superior properties. Building on accumulated technologies and know-how, in 2009 Sony commercialized an olivine-type lithium-ion secondary battery, marking its first step toward full-scale entry into the storage battery market.

Sony's olivine-type lithium-ion iron phosphate secondary batteries

Sony's Lineup of Storage Batteries Encompasses Products for a Broad Range of Uses

After shipments of the olivine batteries began, market needs began to shift toward products that would ensure the stable supply of electricity. Having commenced mass production of an energy storage module in April 2011, in January 2012 Sony began mass-producing a controller that controls both charging and discharging from the module and storage battery conservation. Although more than a year has passed since the Great East Japan Earthquake, general sentiment continues to lean firmly toward storing power for later use. Accordingly, storage modules that facilitate peak shifting and can be used in the event of a sudden power failure are attracting considerable attention for both professional and residential use. In this environment, Sony is responding to the needs of a broad range of customers by augmenting its lineup with compact professional-use storage modules and all-in-one home-use models that plug in for storing electricity, facilitating use at home, in the office or anywhere.

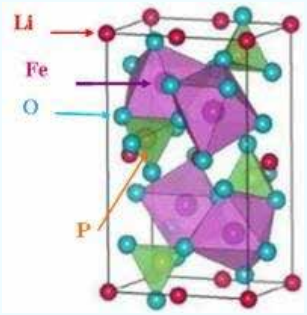
Energy storage module (IJ1001M)

The Exceptional Safety and Reliability of Sony's Products Is Contributing to the Expansion of the Market for Storage Batteries

Until recently, safety standards for rechargeable lithium-ion batteries were formulated primarily for applications in mobile devices. However, with the market for these batteries expanding in recent years, UL, an international third-party testing and accreditation institution, developed a new safety standard for stationary storage batteries mounted with lithium-ion batteries. Sony promptly applied and was granted UL certification for its energy storage module, as well as for its energy storage system, comprising a storage module and a controller, underscoring the safety and the performance of these products. In addition to underscoring the reliability of Sony's products, UL certification is testament to Sony's outstanding technological prowess.

Left: An example of Sony's UL-certified energy storage system (combines IJ1001M and IJ1002C)
Right: Sony's energy storage module (IJ1001M, above) and controller (IJ1002C, below)

Use of olivine-type lithium-ion iron phosphate



Molecular structure of olivine-type lithium-ion iron phosphate

An exceptional feature of the long-life cell developed by Sony, and of the energy storage module in which it is mounted, is the use of olivine-type lithium-ion iron phosphate as the cathode material. The positively charged material is stable, with its crystals binding together for greater strength, and it has a robust crystal structure. Even if the ambient temperature rises, it is difficult for oxygen to detach, thereby providing superior heat stability. While this material is extremely promising, it customarily presents several drawbacks and challenges when applied to secondary cells. However, Sony overcame these issues by applying proprietary material process technology and developing a suitable structure to create a cell with key advantages. Specifically, the cell realizes (1) a lifespan of more than 10 years if fully charged and discharged daily in a 23°C environment; (2) excellent safety performance based on superior heat stability; (3) rapid recharging (can be recharged to 90% capacity or more in just one hour); and (4) high scalability. In addition, since it uses iron (lithium-ion iron phosphate) - a relatively plentiful resource - as the electrode material, it achieves a much lower environmental footprint compared with batteries that use rare metals, which have extremely limited reserves and are in short supply.

Commercializing Energy Storage Batteries

Integrated energy storage battery unit for commercial use

Sony commenced shipments of an integrated energy storage battery unit for commercial use in September 2011. Combining such components as an energy storage module mounted with the Company's own long-life cells, a controller, inverter and converter, this battery delivers a maximum storage capacity of 2.4 kWh. The unit has six power outlets and can function as an uninterruptible power supply (UPS) for commercial users.

Integrated energy storage battery unit (ESSP-2000)

Small energy storage battery unit for household use

General sales of Sony's Home Energy Server, which targets the household market, were launched in Japan in October 2011. This unit features several long-life cells developed in-house by Sony to deliver maximum energy storage capacity of 300 Wh. Boasting a compact design and user-friendly operation, the Home Energy Server may be utilized by home users both for power saving and as an emergency backup supply in case of a power outage.

Home Energy Server (CP-S300E/W)

Efforts Aimed at Realization of a Smart Grid

Development of the Authentication Outlet - Making Possible Power Management and Power Control on an Individual User and Device Basis

Recent years have seen significant changes in conditions relating to electricity and energy, and interest within society in environmental issues and their impact on our lives has greatly increased. Meanwhile, under the existing smart grid concept, most research in such areas as Home Energy Management Systems (HEMS) and Building and Energy Management Systems (BEMS) is conducted from the point of view of an electricity supplier. The principal functionality from a user perspective relates to the promotion of energy conservation by identifying the level of power consumption and providing information on device operational status.

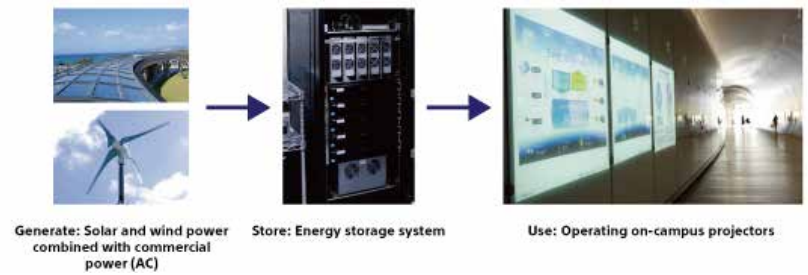
Against this backdrop, Sony has focused on electricity outlets-an essential part of electricity usage infrastructure-and developed the "Authentication Outlet," which enables users to actively manage and control their power usage. Sony has developed two types of outlet, which play an interface role whenever electricity is used. The first category is the FeliCa-type Authentication Outlet, which provides electrical device authentication using Sony's NFC/FeliCa contactless IC card technology. This is based on proven contactless IC card technology, which is used extensively in such spheres as transportation ticketing systems and e-money, with an added authentication function. The second category is the RFID Over Power Line-type Authentication Outlet, which provides electrical device authentication via the power line by utilizing Sony's new RFID Over Power Line technology.

The Authentication Outlet has an IC chip in the plug of an electrical appliance or electric vehicle and a contactless IC card reader on the outlet side. When the plug is inserted into the outlet, electricity is supplied after device and user authentication. Based on this technology, it will be possible to build a new type of control system capable of tracking and managing power usage (consumption volume and history) on an individual-user basis via management of each electrical.

Concept image

Open Energy System (Distributed Small-Scale Energy Network) Demonstration Test

In collaboration with Okinawa Institute of Science and Technology Promotion Corporation (OIST), Sony Group research institute Sony Computer Science Laboratories, Inc. (Sony CSL), is conducting demonstration tests for an open energy system (i.e., a distributed small-scale energy network) that features an energy storage system with our energy storage module and renewable energy (solar and wind power, with commercial power as an auxiliary power source). Sony CSL is currently building an energy storage system at OIST's campus in Onna Village, Okinawa. The system features a Sony 8.4 kWh energy storage module and is connected to commercial power as well as solar and wind power generation systems, using renewable energy to, among others, operate on-campus projectors and monitor stored-energy volume, wind power, temperature and lighting intensity.



Participation in the Pecan Street Smart Grid Demonstration Project, in Austin, Texas

In 2102, Sony is taking part in the Pecan Street Smart Grid Demonstration Project, in Austin, Texas. As a company participating in this demonstration project, Sony is not only performing a wide variety of tests and verification utilizing proprietary power-demand-forecasting technology and power-storage devices as well as providing practical solutions for users, but is also conducting verification in preparation for the commercialization of a HEMS that offers users enjoyment in their ongoing use. Through this demonstration, Sony is exploring ways to build the ideal smart grid business model, which will enable users to have fun while contributing to environmental sustainability.

Note: For more information, please refer to the following press release:

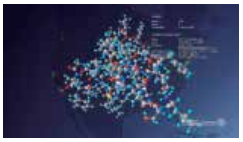
Cell Broadband Engine™ Technologies: Helping to Identify the Mechanics of Disease

Cell Broadband Engine™ and Distributed Computing

Cell Broadband Engine™ (Cell/B.E.) on PLAYSTATION®3 (PS3™) is a powerful new microprocessor that achieves a computing speed approximately 10 times faster than that of a standard PC. Cell/B.E. facilitates the real-time processing of massive amounts of data, inviting a broad range of potential applications not only in next-generation computer entertainment systems and digital electronic products, but also in workstations for movie production and computer simulations in science and technology. Additionally, Cell/B.E. makes it possible to run multiple operating systems (OSs), meaning real-time OSs used in conventional PCs and workstations can run together, as can OSs used in digital consumer electronic products and computer entertainment systems. Distributed computing is a technique for obtaining significant computing capacity by leveraging the capacity of multiple computers, thus eliminating the need for a dedicated supercomputer. This technique is used primarily by universities and research institutes. Calculations are divided into smaller units, i.e., packets, which are then distributed to participating computers. When the computers have finished processing the calculations, they send the data back. Accordingly, more computers on the network mean greater computing capacity. With these technologies, PS3™s connected to a network together act like a supercomputer.

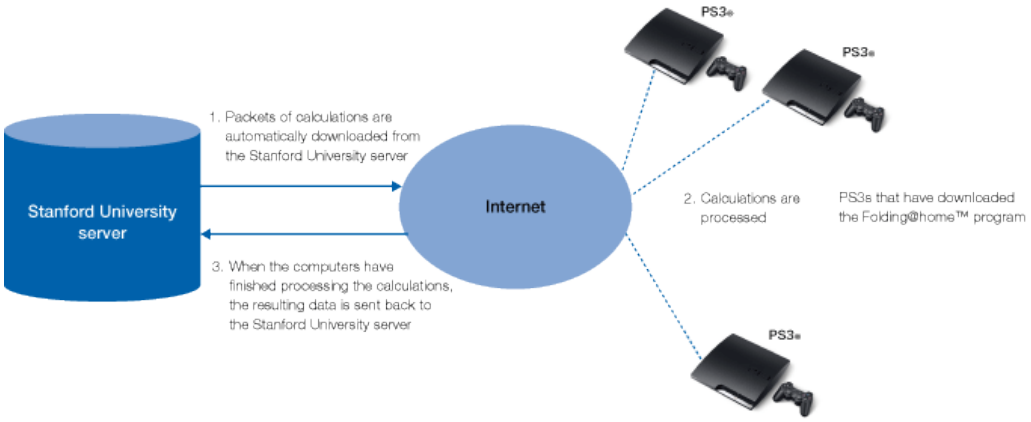
Analyzing Protein Folding on PLAYSTATION®3

Misfolded proteins in the human body are linked to a number of diseases, including Parkinson's, Alzheimer's and cancer. Analyzing protein folding to identify the causes of this phenomenon requires massive computing capabilities. Computer simulations are essential because the folding process is extremely complicated, but with an average PC one simulation would take about 30 years.



The screen of a PS3™ running Folding@home™

Folding@home™ is a distributed computing program established by Stanford University to study protein folding. Participating computers are sent packets of complicated calculations over the Internet. These computers simultaneously process these packets of calculations, greatly reducing the time needed to complete the calculation. Once the computers have finished processing their packets, the resulting data is sent back over the Internet to the Stanford University server.



Folding@home™: How does it work?

In March 2007, Sony Computer Entertainment Inc. began offering PS3™ owners a software application enabling them to donate capacity to Folding@home™. PS3™s, backed by the tremendous computing capacity of Cell/B.E., are thus contributing to efforts to identify the mechanics of several diseases.

Since Folding@home™ for PS3™ was released in March 2007, a huge number of PS3™ users from around the world have taken part. As of May 2010, the amount of donated computing capacity had increased to more than 24 times the pre-release capacity.

Folding@home™ Project Listed in Guinness Book of Records Thanks to PS3™ Power
On September 16, 2007, the Guinness Book of World Records certified the Folding@home™ project as the world's most powerful distributed computing network after it broke the one-petaflop barrier for computing capacity. Thanks to the tremendous computing capacity of the PS3™, the project became the first ever to reach the one-petaflop mark in distributed computing.

Folding@home™ on PLAYSTATION®3

A Stakeholder's Voice

Opportunities in Medical Research

Vijay S. Pande
Associate Professor of Chemistry and of Structural Biology,
Stanford University

Simulation of biological and chemical processes plays an increasingly important role in today's medical science. Folding@home™, a distributed computing project, was established in October 2000 at Stanford University. It applies such simulation techniques to help provide a better understanding of protein folding, misfolding and related diseases. The massive amount of computing capacity needed for our research is provided by volunteers, who connect to the network and donate computing capacity. The project has enjoyed the support of more than one million computers since it began. Sony gave owners of PLAYSTATION®3 systems the opportunity to join the project in March 2007. Within just one month, the donated computing capacity more than doubled, which gives our research a significant acceleration in the quest to understand and eventually develop cures for serious diseases. The keys to success for initiatives like Folding@home™ are technical excellence and sustained volunteer contribution. We count on Sony and other industry partners to continue pushing the limits in these areas.

Innovation for Sustainability

Solution

In addition to taking steps to lower greenhouse gas emissions from its operations, Sony is developing energy-saving products and IT technologies that help reduce CO_2 emissions from Sony products during use by customers.

Digital Cinema Systems

The movie industry is shifting rapidly to digital technology. In 2000, Sony launched the world's first digital motion picture production camera, the HDW-F900, beginning an era of major change in the movie production industry. In 2006, Sony introduced a digital cinema projection system, and is promoting digital cinema as a means of reducing energy consumption and conserving resources.

Movie Production

SRW-9000 high-definition camcorder (HDCAM-SR series)

Within digital cinema, which converts images to data instead of using film, a wide range of efficiency improvements are possible. For example, when shooting with film, one reel only lasts approximately 10 minutes. In contrast, with digital recording systems, not only is it possible to shoot continuously for 50 minutes, the shot scenes can be checked immediately on the spot. Furthermore, post-shooting editing of digital movies offers superior efficiencies, and compatibility with computer graphics (CG)-which have come to be used extensively in recent years-is also high. Consequently, this leads to increased production efficiency and reduced costs.

Released in 2009, the SRW-9000-the first digital high-definition camcorder in the HDCAM-SR series-delivers superb image quality and performance and outstanding maneuverability. Approximately 60% the size and weight of an independent video camera and recorder combined, the SRW-9000 also uses only about half the electricity.*1

*1 Compared with the Sony F23 and SRW-1 combined

Movie Theater Operations

Moreover, because digital data is delivered to digital cinema-compatible movie theaters on a hard disc drive (HDD), there is no need to develop film, substantially reducing the need for water and chemicals used during the developing process. Further, whereas a single two-hour movie on film requires six reels of positive film, the same movie made with digital cinema needs only one HDD, thus increasing the efficiency of shipping and contributing to the reduction of associated CO_2 emissions.

Total emissions of CO_2 associated with a two-hour movie made using digital cinema-from the production of a complete digital cinema package through to distribution to and showing at 300 digital cinema-compatible movie theaters across Japan and final disposal-are estimated to be approximately 160 tons lower than those associated with a movie made using film.*2

Another recent example is the Sony Digital Cinema 4K™ cinema projection system which recieved the 58th Okochi Memorial Production Prize (fiscal year 2011). This system is estimated to achieve a reduction of approximately 40% in CO_2 emissions compared with conventional film-based systems, and is rapidly being adopted around the world.

*2 Based on Sony data; premise for calculation is as follows:

Movie made using film

CO_2 emissions from the following processes associated with a two-hour movie made using film, assuming six rolls of film per movie theater:

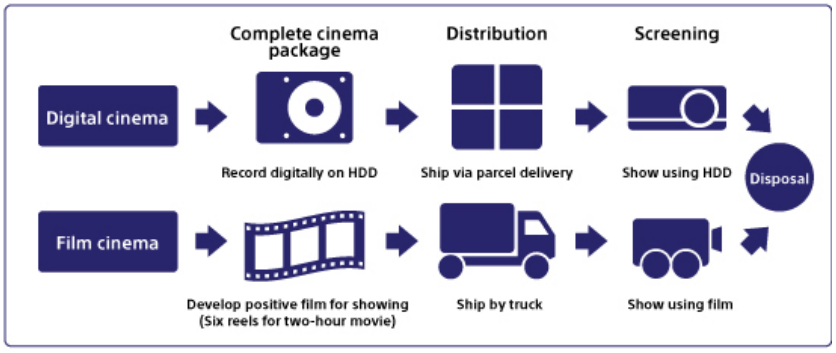
- CO_2 emissions during manufacture and developing of film
- CO_2 emissions during transport of film
  Calculated in ton-kilometers assuming round-trip between Tokyo and each movie theater in a two-ton truck: Weight x distance traveled x fuel used per ton-kilometer x coefficient of CO_2 emissions per unit of fuel used
- CO_2 emissions from projectors during showing of movie
  Power consumption by projectors during showing of two-hour film x coefficient of CO_2 emissions per unit of power consumed
- CO_2 emissions from disposal of film
  Calculated assuming incineration of all positive film used

Movie made using digital cinema

CO_2 emissions from the following processes associated with a two-hour movie made using digital cinema, assuming one HDD per movie theater:

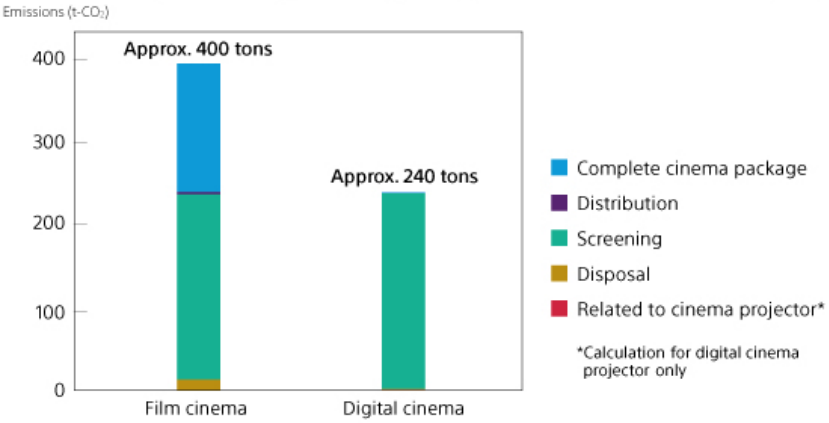
- CO_2 emissions during manufacture of HDDs
  Distributed proportionally assuming one HDD can be used for a total of 120 movies
- CO_2 emissions during transport of HDDs
  Calculated in ton-kilometers assuming round-trip between Tokyo and each movie theater in a two-ton truck: Weight x distance traveled x fuel used per ton-kilometer x coefficient of CO_2 emissions per unit of fuel used
- CO_2 emissions from projectors during showing of movie
  Power consumption by projectors during showing of two-hour film x coefficient of CO_2 emissions per unit of power consumed
- CO_2 emissions from disposal of HDDs
  Calculated assuming landfilling of HDDs
- CO_2 emissions over the life cycle of digital cinema projectors (except during showing of movie)

Comparison of life cycle of movie made using digital cinema and movie made using film



Comparison of CO_2 Emissions at Each Lifecycle Stage

(From creating a complete cinema package for a 2-hour movie, to distributing, screening, and disposing at 300 theaters around Japan)



Video Conferencing Systems

Meetings involving individuals from different locations generate significant CO_2 emissions, the principal component of which is emissions from travel. The use of video conferencing systems can greatly reduce CO_2 emissions associated with employee business trips and other travel. For example, CO_2 emissions associated with a single meeting involving two employees each from five cities across Japan and held using Sony's PCS-XG80 HD video conferencing system are estimated to be approximately 1.1 tons*3 lower than would be the case if the same two employees from each of the five cities were to travel to Tokyo to participate in the meeting in person. For a meeting held 24 times a year, therefore, the total annual reduction would amount to approximately 26 tons.

*3 Based on Sony data; premise for calculation is as follows:

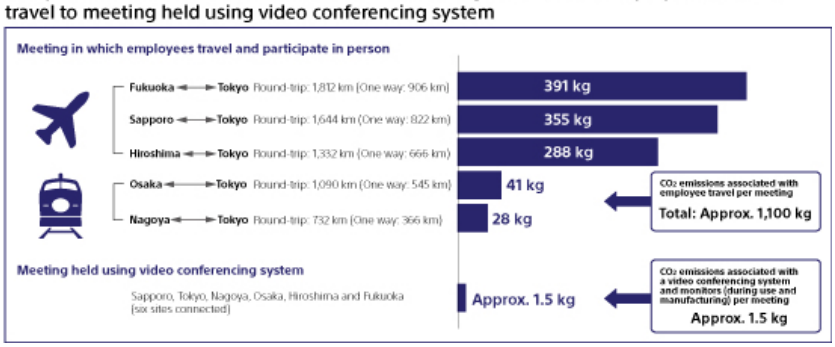
CO_2 emissions associated with meeting in which employees participate in person

- Meeting with participation of two employees each from five cities (Fukuoka, Sapporo, Hiroshima, Osaka and Nagoya) traveling to Tokyo
- Participants traveling between Tokyo and Fukuoka, Tokyo and Sapporo, and Tokyo and Hiroshima, by air; participants traveling between Osaka and Tokyo, and Nagoya and Tokyo, by Shinkansen; coefficient used to calculate emissions: data for fiscal year 2008 in "CO_2 Emissions per Unit of Transport (Passengers)," Ministry of Land, Infrastructure, Transport and Tourism

CO_2 emissions associated with meeting held using video conferencing system

- CO_2 emissions from meeting held associated with use of PCS-XG80 HD video conferencing system linking six locations and six displays (KDL-32EX300) for two hours plus CO_2 emissions during manufacture of equipment distributed proportionally over the number of times the equipment is used (assuming 24 times annually for 10 years)

Comparison of CO_2 emissions associated with meeting that involves employee business travel to meeting held using video conferencing system



PCS-XG80 HD video conferencing system

Innovation for Sustainability

Marketing

In addition to taking steps to lower greenhouse gas emissions from its own operations, Sony is working to develop business systems that ensure the use of its products and services by customers contributes to the resolution of key issues.

A Portion of Reader™ Store Sales Used to Support Environmental Conservation Initiatives on Sumatra Island, Indonesia "Read a Book, Support Forest Conservation" Campaign

The tropical rain forests of Sumatra Island in Indonesia are recognized as a Natural World Heritage Site by UNESCO. However, deforestation over the past 30 years has led to a dramatic decline in forested area. Sony supports a project for forest conservation in Sumatra run by the World Wide Fund For Nature (WWF) Japan. Part of the revenue from sales of e-books at Reader™ Store-Sony's e-book store-is donated to the WWF Japan conservation project, and customers can also participate in the project by donating Sony Points.

For more information, please see:
Project for Forest Conservation in Sumatra

Sony Group Companies Support the Adoption of Renewable Energy Sources Through the Solar Bear Fund

For the next generation and to help realize a sustainable society, Sony supports the efforts of the Solar Bear Fund, a Japanese NGO involved in the promotion of renewable energy sources as a means to address global warming.

For more information, please see (Japanese only):
Sony Group and the Solar Bear Fund

Carbon-Offset Investment Trust

In an initiative aimed at mitigating greenhouse gas emissions, Sony Bank Inc. donates to the Japanese government greenhouse gas emissions rights it has purchased on behalf of customers whose holdings in funds that make up its carbon-offset investment trust exceed a specified amount. This system enables customers to participate in an environmental preservation activity while Sony Bank manages their investments. The initiative covers three eco-funds, which have donated greenhouse gas emissions rights totaling 1,000 tons in fiscal year 2008, 2,200 tons in fiscal year 2009, 1,000 tons in fiscal year 2010 and 1,000 tons in fiscal year 2011.

For more information, please see (Japanese only):

Innovation for Sustainability

Design

A Portable Charger Kit Borne from Sustainable Design

"odo": The concept behind sustainable design

To help realize a sustainable society, Sony promotes the concept of sustainable design. As one expression of this concept, Sony launched the "odo" design project, which has applied this concept to a group of model devices focusing on kinetic energy-based products. From a universal design perspective, the devices are easily accessible even for children, while also applying the principles of eco-design. Using your body to generate energy as you use these devices facilitates a new level of interaction.

As an example of a design incorporating hand-powered generation, in June 2012 Sony launched the CP-A2LAKS portable USB charger kit. In this model, in addition to the conventional portable charger used with smartphones and other devices, Sony has newly included a hand-cranked, USB charger unit. By turning the charger handle, you can generate enough power to talk on a smartphone for approximately one minute. The device is convenient for outdoor use or when there is a power blackout. To ensure that the design provides ease of portability, the hand-crank input unit may be detached from the USB output unit.

- For details on the range of "odo" products, please visit the Sony Design website:
- For details on the CP-A2LAKS USB charger kit with a hand-cranked unit, please visit:

Sustainable Packaging

Packaging policies have been a key facet of Sony's environmental initiatives for some time. Keeping the consumer's perspective firmly in mind, designers are expanding efforts to create sustainable packaging by considering, among others, how packaging be made more conducive to appropriate management after use and how it can make unboxing a new Sony product an exciting and satisfying experience.

A sustainable package redesign project resulted in the development of a brand-new slim carton for the VAIO® S series, launched in fiscal year 2011. The designers in charge began by verifying the relationship between packaging and customers and, after reviewing the results of this process, resolved to employ environmentally conscious materials, as well as to minimize the size and volume of materials used in the carton, making it easy to open and possible for customers to recycle immediately after opening.

Looking ahead, Sony will continue to incorporate the principles of sustainable design into its packaging development efforts.

For more information, please visit the Sony Design website: