CORPORATE SUSTAINABILITY CASE STUDIES 2016
Featuring: Singapore Sustainability Awards 2015 Winners

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Foreword

Sustainability scored two huge global wins last year. First, it was the successful renewal of commitments towards sustainable global growth through the Sustainable Development Goals. Second was the Paris Agreement where governments finally came to an agreement and brokered a deal that is accepted by all nations, to recognise and combat the real threats of climate change. On both wins, the business community played a pivotal role in enabling the negotiations through the sharing of their technology, economic case and community influence in countries they operate in.

In Singapore, the two international efforts also led to significant milestones with sustainability as the national agenda. At the governmental level, we saw the revised version of the Sustainable Singapore Blueprint and the launch of Singapore’s Climate Action Plan by our President. In the private sector, we witnessed the implementation of the “Comply or Explain” sustainability-reporting requirement by the Singapore Exchange, the regulatory body of Singapore listed companies.

With the global and local sustainability agenda taking centre stage, early business adopters are already benefitting from this shift complementing the increasing demand by the informed consumers to vote with their dollars for sustainable businesses. As this trend is set to grow, the businesses community will have to adapt or risk being eliminated. Companies must look into sustainability beyond just ticking the box, but truly integrate it into their business modus operandi.

However, the road to achieving sustainability is not a simple or straightforward one. It differs from company to company depending on the nature of their business. Therefore, this annual book of case studies becomes increasingly important for businesses, both big and small, to find out more what has been done and adapt it for themselves as part of their sustainability journey.

At the same time, we would like to acknowledge the winners of Singapore Business Federation’s Singapore Sustainability Awards 2015 that have kindly contributed their stories to this publication. Their willingness to share their experience with the business community will greatly benefit the readers and for that, we would like to express our sincere and heartfelt gratitude towards them.

As we enter into a new decade of the sustainability movement in Singapore, Global Compact Network Singapore (GCNS) is committed to serve the business community in Singapore towards achieving sustainability. The integration of SBF’s Sustainable Development Business Group and GCNS will provide the resources needed to better serve companies by equipping them the necessary competitive advantage needed in the face of the new global agenda.

Mr Wilson Ang
Executive Director
Global Compact Network Singapore
Foreword

By The Dean, Nanyang Business School, Nanyang Technological University (NTU).

The Nanyang Business School is delighted to partner with the Global Compact Network Singapore (GCNS) to jointly publish this handbook featuring case studies of business organizations that won the Singapore Sustainability Awards in 2015.

Sustainable Earth is one of the peaks of excellence and key research areas at NTU. Since 2005, NTU has secured grants to the tune of $1.3 billion for research related to sustainability. Two of our flagship research centres are the Energy Research Institute @ NTU (ERI@N) and the Nanyang Environment & Water Research Institute (NEWRI). ERI@N focuses on research related to renewable energies and sustainable urban mobility solutions. NEWRI focuses on research related to sustainable water technologies both for developed and developing countries. NTU organizes the Singapore Sustainability Symposium annually which focuses on thought leadership and policies for Sustainable Cities. NTU also has many corporate laboratories setup in collaboration with global corporations, that focuses on research related to sustainability. For example, the corporate lab setup with BMW focuses on e-mobility.

At the Nanyang Business School, we host the Centre for Business Sustainability. This centre is a platform for exchange of interdisciplinary research ideas. The centre hosts interdisciplinary research seminars that focus on business sustainability by leading global scholars and academics, as well as industry leaders. The centre also initiates interdisciplinary research focused on business aspects of sustainability with the Engineering Schools and research centres within NTU.

We are pleased to see a varied line up of award winners from both Sustainable Business and Green Technology category that include multinational corporations, an SME as well as a government statutory board. These organizations displayed great enthusiasm throughout the process of award evaluation, selection and case writing, where they eagerly shared their sustainability stories with our research team about their practices and efforts.

The case studies featured in this handbook look at specific sustainability topics that are unique to each company and/or industry. The cases will appeal to a wide audience – both sustainability practitioners and academics. Here are some of the highlights of the case studies:

- **Ardentec** is a leader in providing chip and wafer testing services for integrated manufacturing devices (IMDs) and showcases its cutting-edge technology to provide top solutions for their customers.

- **Buckman Laboratories** has developed innovative chemical solutions for their target markets that help customers with resource optimization and environmental impact reduction.

- **Maritime and Port Authority of Singapore (MPA)** has used sustainability as an industry growth strategy and leadership culture to promote green shipping practices to the maritime business community.

- **Canon Singapore**: This case focuses on Canon’s advanced green technology products that are unique in providing the least environmental impact with durable energy-efficient office network machines.

- **Elmich Pte Ltd** is a case that demonstrates how the green building industry has the potential to be a game-changer in reducing emissions and heat from buildings by using products from natural sources and recycled plastics.

We hope that you will find this Case Study handbook, produced jointly by GCNS and Nanyang Business School, with its varied sustainability themes, both enlightening as well as inspiring and help start (or further continue) your own sustainability journeys.

Dr. Neo Boon Siong
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Nanyang Business School
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Sustainability Case Study on Canon Singapore Pte Ltd

Written by: Tayef Quader, S. Viswanathan

The digital print and imaging business is a multi-billion-dollar industry. In 2013, the print market was valued at US$130 billion and the digital photography market at US$68.4 billion. The growth of emerging economies, increased penetration and proliferation of smartphones and the exponential growth of social media has radically altered the industry market structure.

Digitization can ring the death knell for many incumbents in the print and imaging industry. Canon has been able to ride this digital wave by developing sustainable print, document and imaging solutions. This can not only reduce their environmental footprint, but also help them develop new business opportunities, thus helping their triple bottom line.

Canon Inc., a Fortune 500 corporation, is a global market leader in the photographic and digital imaging industry. In 2012, the company held a market share of 21% in sale of printers, copiers and multi-function devices (MFDs) and 23% in the sale of digital cameras. Canon's roots date back to 1933 in Japan where it made its name as a camera producer. At a time when most technological products came from Germany, four young founders made a prototype camera and named it Kwanon, after the Buddhist goddess of mercy. The company officially changed its name to Canon in 1947 and is now renowned for producing high-quality cameras, lenses and lens equipment, photocopiers, MFDs, printers and document system software. With over 80 years of experience, Canon offers a wide range of products serving various types of customers in the print and imaging industry.

Canon prides itself in being committed to ceaseless innovation and product development. It became an international brand with exports accounting for half of its sales even back in the 1960s. In 1968, the company started producing photocopy machines and by mid 1970s it ventured into producing laser printers. The next two decades witnessed Canon's continued drive to develop high grade computer systems, sophisticated and advanced cameras, copiers and digital imaging systems.
At present, Canon has a global network of around 300 companies and subsidiaries, and employs about 200,000 people worldwide. It is dedicated to innovation and making advancements in technology. Canon invests approximately seven to nine percent of its net sales revenue into research and development (see Figure 1) and is ranked among the top three U.S. patent holders in 2015.6 It has successfully held the largest global market share in the digital camera industry for interchangeable lenses for the last 13 consecutive years from 2003-2015.7

The Kyosei philosophy

The Kyosei is the foundation of Canon’s corporate philosophy and forms the basis for the development of green technologies and sustainability initiatives at Canon. Kyosei means to live and work together in harmony for the common good. Canon interprets this as taking care and being part of the community, and to conduct business in a responsible and sustainable way. The company is proud of its long tradition of protecting and preserving the most precious resource – the world we all share. Thus, Kyosei lays the company’s founding principles in business conduct; to have a balance between environmental commitment and economic interests in business.

The Kyosei philosophy also implies that communication with stakeholders, interest groups, customers and general public is important for Canon. Transparency and accountability is ensured by sharing long-term company direction with stakeholders and behaving responsibly with customers.

Canon Singapore Pte Ltd

Canon opened its office in Singapore in 1979, one of the first international corporations to set up operations in the island state. The parent company is headquartered in Tokyo, Japan. The Singapore office serves as the regional headquarters for 18 South and South East Asian countries, including subsidiaries in India, Malaysia, Thailand and Vietnam. In 2004, the sales and marketing divisions were merged to oversee both regional and domestic activities in Singapore. It now employs a team of direct sales personnel and has a network of more than 100 dealers throughout the island nation. Canon Singapore employs around 900 people and is responsible for marketing a comprehensive range of Canon’s digital imaging products and office solutions.

CORPORATE SUSTAINABILITY EFFORTS AT CANON SINGAPORE

Business innovation through green technologies

Canon strives to improve the value it provides to customers by leveraging on green technologies that help them achieve environmental sustainability. Green technologies are utilized in both products and software solutions.

Unique product values are offered through:
- Creating environmentally conscious products
- Environmental-friendly manufacturing methods
- Environmentally conscious logistics
- Eliminating use of hazardous substances
- Collecting and recycling used cartridges

The software solutions help customers either reduce their product usage or provide information and tools to reduce their environmental impact in their own operations. The imageRUNNER ADVANCE (iR-ADV) series MFD and the UniFLOW Document Solution Software are its flagship green product and software solution that enables customers to save on energy consumption and paper usage.

Figure 1: Canon’s net sales to R&D expenditure ratio of 2005-2014.
The iR-ADV Office Series MFDs
Canon's top-selling MFD (all-in-one printer and copier) the imageRUNNER ADVANCE (iR-ADV) series, adopted eco-friendly design techniques for CO2 emissions reductions in each lifecycle stage. The iR-ADV is an innovative product that showcases futuristic technologies at work. It uses plant-derived biomass plastics in its exterior parts, one of the first of its kind in the printing industry. This helps to reduce lifecycle CO2 emissions significantly and also aids in recycling at end of life where it can be converted into regenerated plastic without the addition of new raw materials. It is incorporated with on-demand fixing (RAPID Fusing) technology, which produces heat only when the MFD is in use, thus reducing power consumption. All these innovations and other design features helped it achieve a lifecycle CO2 emissions reduction of 47% compared to its previous model.

In addition, the iR-ADVC2030F-R, iR-ADVC5051F-R and iR-ADVC5035F-R models of this product series are produced from remanufacturing of old copying machines. These models have an average parts reuse rate of 66.3%, 75.8% and 73.3% respectively, thus reducing CO2 emissions significantly from procurement and manufacturing stages. The iR-ADV series devices are also certified as a green product under the Green Label Scheme of the Singapore Environment Council.

Besides the iR-ADV series, Canon has used its innovative and green technologies in other products such as the imagePRESS Color Digital Press machine, the PIXMA multi-function inkjet printer and the ESO Rebel T5 Digital SLR Camera.

eMaintenance
Canon provides an online management system accompanying all its products and software solutions called the eMaintenance. It is a remote troubleshooting platform that empowers and adds depth to the company's green technologies. The system allows customers to manage their Canon devices more efficiently and check on routine maintenance, cartridge replacement and when a service is due. Customers are able to control their MFDs as the system can send automatic alerts to administrators and Canon service representatives when a servicing date is coming up.

The system is also equipped with a toner-on-demand function which alerts the user about order planning and stock control. It aids customers to properly plan their orders and reduces the need for manual checking, increasing machine uptime. Canon service representatives are able to check on their products remotely thus eliminating time and resource wasted on physical inspections.

In terms of data security, the company ensures safety of its facilities through internationally accepted standards. The eMaintenance operating facility is a certified Internet Data Center (IDC) and complies with several ISO and other international standards.

Environmental Performance Calculator
Canon has developed an in-house Environmental Performance Calculator (EPC) to help customers track and monitor the energy consumption of their products. The calculator compares the energy consumption pattern of a customer's current office equipment fleet versus a proposed new Canon fleet whose consumption is based on the U.S. Environment Protection Authority's (EPA) ENERGY STAR 2.0 standards.

CANON CARTRIDGE RECYCLING PROGRAMME
Canon runs a global cartridge recycling programme in all countries where it operates. Toner cartridge recycling by Canon started in 1990 and presently includes both ink cartridges from products using inkjet technology and toner cartridges from products using laser technology. Components are disassembled and categorized and sorted into plastics and different types of metals using magnets, air and other automated technologies.
The different categories of components are melted and used in the manufacture of new components. Recycling cartridges and re-manufacturing them reduces the carbon footprint not only from the reduced new raw material usage but also from reduced energy consumption in manufacturing.

One of the challenges in cartridge recycling is the design of a mechanism to ensure collection of old cartridges from consumers. Project Homecoming is a joint initiative between industry players Canon, Epson and Brother to promote and bring cartridge recycling to the community. With support from government agencies such as the National Environment Agency (NEA) and the National Library Board (NLB), it encourages local communities to do their part in recycling used cartridges. The NEA provides information on available recycling locations through its awareness programmes and the NLB has designated drop-off boxes in all of its libraries across the island. The initiative also recycles toner and ink cartridges from non-participating brands thus increasing access to a wider community.

As can be seen from Figure 2 and 3, cartridge recollection volume has increased almost five fold in the last 10 years reflecting the success in cartridge recollection. The percentage of cartridges recycled into reusable cartridge components for new cartridges represent 24% of total global cartridge recycling by Canon. The remaining 76% of recycled materials is used for energy recovery and materials in other applications such as PET bottles.

**CO₂ emissions reduction project in Singapore**

Canon Singapore embarked on a CO₂ emissions reduction project to reduce emissions from their logistics. The project utilized the Lean 6 Sigma methodology to improve the export cartage process. Implementation of this project helped to reduce cartage costs by 20% and subsequently reduced emissions by around 50% compared to the original process. The project’s success was recognized at the WDA-SMA Productivity and Innovation Awards in 2011 where Canon received a Bronze Award. It was estimated that this project reduced CO₂ emissions by roughly 70% from 78 tons per year to only 15.6 tons per year.

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**Emissions offset programme**

Canon became the first company in Japan to implement the carbon emissions offset programme in 2014 for its MFDs. Under this programme (launched by Japan’s Ministry of Economy, Trade and Industry) products can offset the emissions with an equivalent amount of credits earned from another greenhouse gas (GHG) emissions reductions project. Canon’s six remanufactured MFDs including the IR-3225F-R model have been certified under this programme as an environmentally conscious product.

**LCA Management System**

A key tool in the development and evaluation of new innovations and green technologies is the life cycle assessment (LCA) methodology. Canon has deployed LCA to systematically evaluate the environmental impact of its products from 1992. LCA is a quantitative method to ascertain the environmental impact at different stages from raw material extraction, manufacturing, final assembly, actual use and disposal. The methodology helps product designers identify areas where modifications are necessary to reduce the life cycle emissions of a particular product.
According to the United Nations Environment Programme (UNEP), integrating a life cycle perspective enables companies to make the product development process more sustainable. Organizations can benefit from better environment, health and safety controls as incorporating such an approach will improve brand image and value. The LCA approach also benefits consumers with more information on purchasing, transport and energy sources to guide them to make environmentally-conscious decisions.10 Canon has greatly benefitted by implementing LCA in its product design and development stages and successfully reduced lifecycle emissions in current products compared to previous models.

SUSTAINABILITY MANAGEMENT AND COMMUNICATION

Internal sustainability auditing
Based on the company’s environmental vision, Canon has adopted a global two-layer audit cycle (a standardized audit from the global office supplemented by the local office based on local requirements). As shown in Figure 4, the audit structure accelerates the attainment of the group’s environmental objectives. It follows Canon’s environmental standards and reference values as they are stricter than existing legal and regulatory requirements covering 16 common fields of environmental assurance, such as water, soil and groundwater quality. Canon’s goal in setting these standards is to ensure thorough compliance with all applicable laws and local ordinances.

Sustainability reporting and environmental accounting
Canon published its first Environment Report in 1999. The report highlighted the company’s efforts to reduce its environmental footprint. In 2003, the company adopted the Global Reporting Initiative’s (GRI) standards and began publishing sustainability reports annually with an aim to share its activities, projects, plans and company information with customers, shareholders and general public. The Global Environment Centre (GEC) takes the lead in formulating the report by incorporating data from its global operating and manufacturing facilities. The report details the company’s practices in all areas to demonstrate its commitment towards a sustainable society.

Canon takes environmental footprint seriously, and is one of the leading corporations to account and put a monetary value towards environmental costs and benefits. In 2014, the company invested ¥21.6 billion in environmental preservation efforts of which ¥9.35 billion was invested for decreasing environmental footprint and for efficiency improvements. This effort resulted in benefits of ¥11.43 billion in monetary terms and customer benefit of around ¥53 billion as displayed in Figure 5.11
Sustainability Outreach

The H3ROES Programme

Canon Singapore and the NEA launched a five-year youth outreach programme in 2011. This initiative aims to instill the culture of sustainable living and provides practical knowledge on environmental issues like waste management among Singapore youths. The goal of the programme is to help the youth to assume environmental stewardship roles in their schools and local community.

In line with Canon's Kyosei philosophy, the programme cultivates a life-skills attitude which is applicable in varied life and work situations beyond schooling years. To date, the H3ROES Programme has partnered with over 77 schools and benefitted over 250 students in Singapore.

Corporate responsibility

Canon has in place a group-wide environmental management system to monitor and track sustainability initiatives in its regional offices and operating facilities. The GEC is the main arm of the company's sustainability efforts and reports directly to the President of Canon Inc., and is in charge of:
• Monitoring and analyzing environmental regulatory information,
• Setting policies and rules, and
• Developing and managing evaluation methods for environmental assurance activities for the whole group.

The head of the GEC oversees Canon group’s environmental programme. Canon's operating facilities are certified under a consolidated group-wide ISO 14001 Environmental Management System. As at 2015, a total of 127 companies in 40 countries under the group have been certified. The GEC is also the decision-maker representing senior management for environmental policy making and setting of goals for Canon. See Figure 6 for GEC’s structure.

Group CSR Activity Policy

Canon and its operating facilities worldwide adopt a shared approach towards Corporate Environmental Responsibility (CER). The company established a Group CSR Activity Policy (Figure 7) in January 2011 that governs all CER initiatives across the group. Environmental sustainability objectives and goals such as energy and water consumption reduction are periodically monitored with additional follow up audits conducted to encourage continuous improvement.

At Canon Singapore, an Environment Promotion Committee (EVP) is in charge of environmental and community engagement activities. The EVP’s key objectives are to promote corporate responsibility activities, formalize roles and responsibilities to promote efficient implementation and leverage on environmental activities that support Canon's business operations. The committee comprises members from different functional units such as product development, marketing, corporate communications, health and safety, and general affairs.

ACCOMPLISHMENTS AND ACCOLADES

Canon's effort in reducing its environmental impact has obtained global recognition. It has won several awards.
for its product innovation, product design, environmental and community engagement programmes, all of which helped the company to grow its revenue and reduce its global environmental footprint. The company has been successfully reducing its lifecycle CO$_2$ emissions per product year after year as depicted in Figure 8.

**Certifications**

In August 2006, Canon Singapore obtained the ISO 14001 Environmental Management System certification and was added to the consolidated group certification. The company has demonstrated an environmental management strategy to promote sustainable development in line with its corporate goals. Canon Singapore is also certified for ISO 22301 Business Continuity Management (BCM), ISO 9001 Quality Management System and OHSAS 18001 Occupational Health and Safety. With these established standards being practiced, Canon ensures compliance with regulations and promotes green innovation, quality and safety throughout its operations. The company’s push for green technology is a unique selling point for its products, as Canon is also certified under Eco Mark Programme in Japan and the International Energy Star Programme.

**Green labels**

Besides the iR-ADV MFD series, Canon Singapore has received the Green Label certification for its paper products: the Business High Grade Paper, Office Paper and Multipurpose Paper which are certified as “paper made from sustainable sources” under the Green Label Scheme of the Singapore Environment Council. The Green Label attests Canon’s pro-environment approach towards its products and also helps customers to easily identify environmentally and socially responsible products.

**CONCLUDING REMARKS**

Canon’s quest for ceaseless innovation has taken the company to new heights. Making significant investments in research and development has helped it to develop green technologies for products, processes and software solutions. Canon has been among the top five U.S. patent holders for 30 consecutive years and the top Japanese patent holder for 11 consecutive years. Its Kyosei philosophy along with other efforts such as cartridge recycling, emissions reduction and emission offset projects, and sustainability outreach programmes has helped it make an impact in environmental performance. Making further investments in R&D and innovation will help Canon develop new green technologies as it continues to strive to improve its sustainability performance.
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