

# **An Innovating Japan, Capitalizing on Green**

By Pamela J. Gordon, CMC

*While most of the world's electronic product companies are racing to meet new environmental requirements set by a cadre of governments and customer companies, many companies in one country have already quietly enlarged their market shares through anticipating environmental needs, then designing products and services to meet them.*

Dozens of companies in Japan are on their way to being market winners through identifying future needs, developing technology to meet those needs, and proactively marketing their solutions to the global market.

I am referring not only to Japanese electronic products being five years ahead on removing lead (with no technical problems to date, according to Dr. Paul Goodman of ERA Technology ), but also to a host of other business and technology advances. Examples of innovations by Japanese companies and ways they are capitalizing on "green" solutions for the global market include the following:

- Booming sales of hybrid electric cars. Sales grew 960% from 2000 to 2005. And 95% of this niche is occupied by Japanese companies. At General Motors, Vice Chair Bob Lutz - who chose horsepower over efficiency - has admitted that his company missed the ball on hybrids. Though some American car makers are now introducing hybrid cars, these cars are much less efficient than their Japanese counterparts. In California, three models of hybrids - all Japanese - are now allowed in the high occupancy-vehicle lanes when occupied by even one person.
- Replacing plastics made of petroleum, whose properties can hinder efficient recycling and whose cheap and ample raw material (oil) will be neither cheap nor ample. For example,
  - ◇ Sony has switched from petroleum-based plastics to renewable bioplastics and virgin or recycled metals (e.g., aluminum and magnesium) for casings for many popular electronic products.
  - ◇ NTT DoCoMo and NEC developed a mobile phone using an environmentally friendly bioplastic material (called polylactide) for 75% of the surface of the 3G phone (announced December 13, 2005).

These products are increasingly in demand for aesthetic as well and environmental reasons.

- Advancing recycling technology. In September 2005, a commission of European scholars and business professionals toured Japanese recycling facilities, to witness practices that are 5 to 10 years ahead of recycling technology elsewhere. Many Japanese recycling companies have lucrative plans to export their advanced technology to other regions. Japan's clear goal is to progress home appliance and other electronics recycling with an anticipation of Japan running out of landfill as early as 2008; to this end, Japan created aggressive recycling targets back in 2001 and so far is recycling about 30% above those targets.
- Environmental engineering breakthroughs. Among the world's leading environmental engineering firms is Tokyo based conglomerate Ebara Corp., whose management is dedicated to helping build a "zero-emission society." It has developed numerous in-house-invented technologies for a range of environmental applications, including energy conservation, pollution control, advanced recycling, and closed process engineering systems and services. Revenues for these environmental programs topped US\$2 billion back in 2004, and by penetrating the Chinese market the company's revenues should soar.
- Smallest, most energy-efficient products.
  - ✧ Since the 1970s, Japanese companies have invented ways to make products as small and energy efficient as possible - taking market share away from Swiss watches, US audio and television products, and others of the world's consumer products.
  - ✧ Today, some of the world's most energy-efficient appliances come from Japan, such as Daikin Industries' air-conditioners. The products are smaller and far more efficient than other brands.
- Innovations well beyond consumer products. Hardly limited to consumer products, Japan's innovations now include aircraft wings. For the first time ever, Boeing is now purchasing an aircraft wing from an outside company - a Japanese company designing and manufacturing the wings in Japan.

Combined, the global market value for cars, materials, recycling, environmental engineering, electronics, electrical appliances, and aircraft constitutes a lion's share of the world's commercial product economy. Japan currently has the world's fourth largest gross domestic product (GDP), behind the US, China, and the European Union. Competitiveness in these areas could shift national GDP ranking this century, when shortages of natural resource and environmental catastrophes (such as last month's chemical spills in China) demand newly designed products and services.

## **Driving Global Suppliers to be Green**

For Japanese companies to meet their internal goals for environmental efficiency - both in products and operations - they are requiring that their suppliers around the world produce products that are less power hungry, easily recyclable, and desist from containing hazardous substances. Indeed, Japan's leadership on several environmental fronts is creating waves of environmental steps around the world.

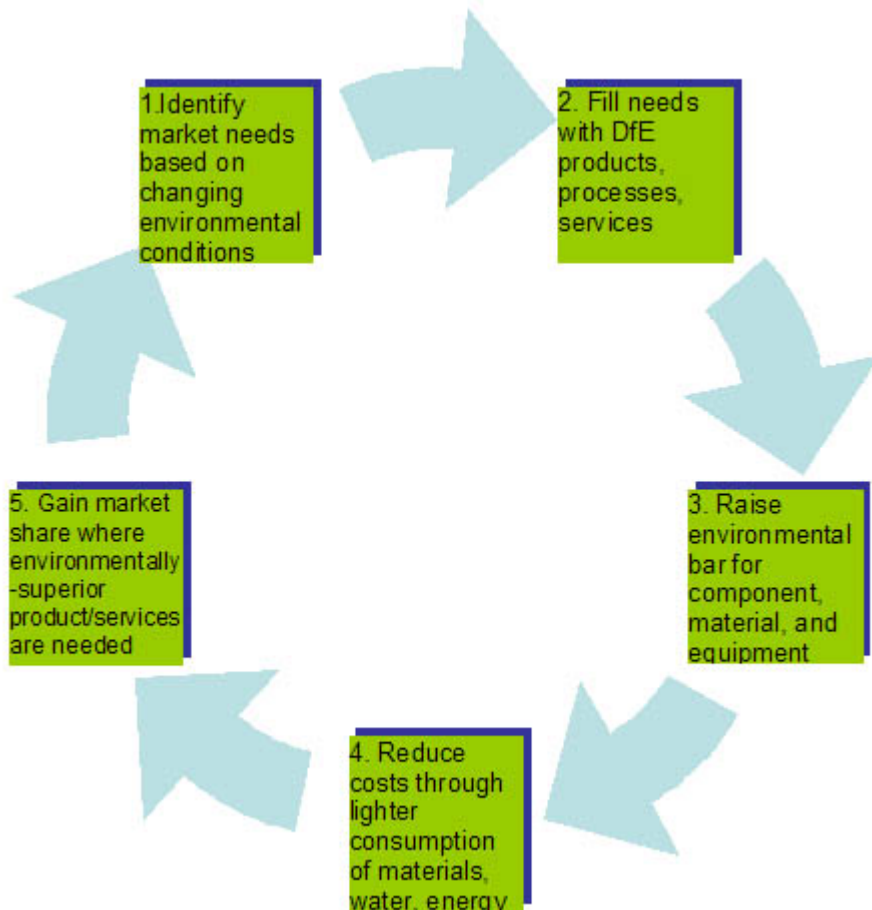
These waves include Green procurement requirements set by Sony, Hitachi, NEC, Toshiba, and other Japanese companies caused global suppliers to remove dozens of hazardous substances years before RoHS takes effect in July this year. Japanese semiconductor companies have been pushing for greater energy efficiency from companies making semiconductor manufacturing equipment. In December 2005 at SEMICON Japan, representatives from US companies Intel, EMD, and Texas Instruments spoke of requiring that their suppliers follow SEMI S23 - 0305, the Guide for Conservation of Energy, Utilities, and Materials used by Semiconductor Manufacturing Equipment. Back in May 2005 in Kyoto, Japan, the Japanese Electronics and Information Technology Industries Association (JEITA) chaired a meeting of the World Semiconductor Council (including European, South Korean, Taiwan, and US members) discussing cooperative approaches in protecting the global environment.

## **Increasing the Bottom Line as Well**

Semiconductor companies demanding energy-efficient tools will reduce operating costs, benefiting their bottom lines. In fact, design for environment (DfE) reduces costs for nearly any manufacturer, service provider, and customer. Naturally, eliminating unnecessary materials, processes, water, and energy reduces cost of goods sold - whether manufacturing watches, cars, or aircraft wings, or providing recycling or engineering services.

Illustrated in the figure is the cycle of success from designing, executing, and marketing innovative products and services to meet changing environmental requirements.

**Figure.** Capitalizing on Changing Environmental Needs: Bottom and Top Lines (DfE=Design for Environment)



### Let the Competition Begin

Japan is not the only country in which companies are innovating green solutions for a world whose ecological footprint is 20% more than what is available on the planet. Siemens in Germany, Philips in The Netherlands, Hewlett-Packard in the US, other large companies, and an explosion of start-up companies are designing remarkably efficient products for this century. But if one country is singled out as being home to the most diverse environmental innovations already deployed in commercial products, it is Japan.

So, set your competitive sights on Japan and capitalize on green. By doing so - in the new world market - everyone will win.

#### Notes:

i) Mentioned by Dr. Goodman on December 14, 2005, at SEMI's EHS International Compliance and Regulatory Committee Meeting (held in San Jose, California).

ii) "The Hot Hybrids," by Jim Motavalli, *E Magazine*, November/December 2005, p. 56.

iii) Interview with Professor Martin Charter, Director of The Centre for Sustainable

*Design (UK), November 2005, via phone.*

iv) *"Ebara Strives to Build Engineering Practice from Industrial Base," Environmental Business Journal, November 11/12, 2004.*

v) *Interview with eco-specialist designer Steven Weininger, November 2005, Miami, Florida. And <http://global.daikin.com/global/index.html>.*

vi) *The World Fact Book, based on 2004 estimates for GDP. Data updated November 1, 2005.*

vii) *Joint Statement on the Ninth Meeting of the World Semiconductor Counsel, May 19, 2005, Kyoto, Japan.*

viii) *"The Ecological Footprint: Living Well within the Means of Nature," World Wildlife Fund, 2004. Also [www.footprintnetwork.org](http://www.footprintnetwork.org).*

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