



# Environment

## Environment Preservation and Sustainable Growth



LG Electronics is conducting green management to preserve the natural environment, promote the growth of the society, and improve the quality of people's lives. To fulfill its environment duties throughout the entire product lifecycle, LG Electronics pursues an ongoing development of green technology while minimizing the amount of direct and indirect greenhouse gas.

LG Electronics also seeks to reinforce its green business partnerships, strengthen the Global Management System of Energy, Environment, Safety and Health (EESH), and double its efforts in managing discarded electronic products. LG Electronics promises to further the efforts in providing greener products and services to the customers.

A respected company in the 21st century is the one that uses its knowledge and technology to minimize its impact on the environment, restore the ecosystem, and fulfill its social responsibility to help people suffering from natural disasters resulting from climate change.

In regard to this, I think LGE is certainly a respected company, considering all the efforts made and performance achieved in 2010.

LGE reduced greenhouse gas that is not only produced during the development, but also from the product use. To promote the reduction of the greenhouse gas throughout the supply channel, the company initiated the Low-Carbon Purchasing to prioritize the products of the business partners participating in greenhouse gas reduction. Also, the company conducted the installation of solar cells in the presidential palace of Maldives jointly with 350.org, the world's representative non-profit organization against the climate change.

The world is still experiencing from the increase of greenhouse gas, depletion of natural resources, and disruption of the ecosystem. This is a threat to the natural environment, worsening socioeconomic instability and uncertainty of the future. Today, the social and environmental responsibility of a corporation is greater than ever.

As one of Korea's leading companies, I hope that LGE will position itself as one of the 21st century's most representative brands through its value creation and sustainability management.



### **Ji In Chang**

Chairperson of Carbon Disclosure Project(CDP) Korea



# Greener Products

With the green product strategy focusing on energy, human and resources, LG Electronics is exerting ongoing efforts to implement its environmental responsibility throughout the whole product lifecycle via partnership with suppliers and management of wasted electronic products, thus to provide customers with products and services that are environmentally consciousness.

## OUR APPROACH

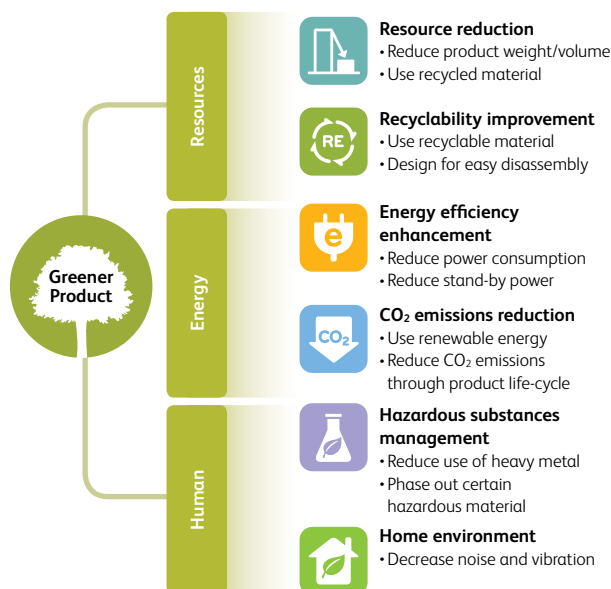
- Continue to increase the number of greener products
- Provide customers with the information on product environmental performance
- Research and develop to increase recyclability of products
- Pursue the green growth jointly with suppliers to extend green management across the whole value chain

## OUR PERFORMANCE

### GREEN PRODUCT STRATEGY

LGE's greener products aim to lower the environmental impact throughout the whole value chain. LGE divides Green Product Strategy into three sectors: Energy, Resources, and Human, and they are based on the eco-design to promote or enhance energy efficiency, resource conservation, and living environment. For more information, please visit the homepage: <http://www.lg.com/global/sustainability/environment/greener-products/index.jsp>

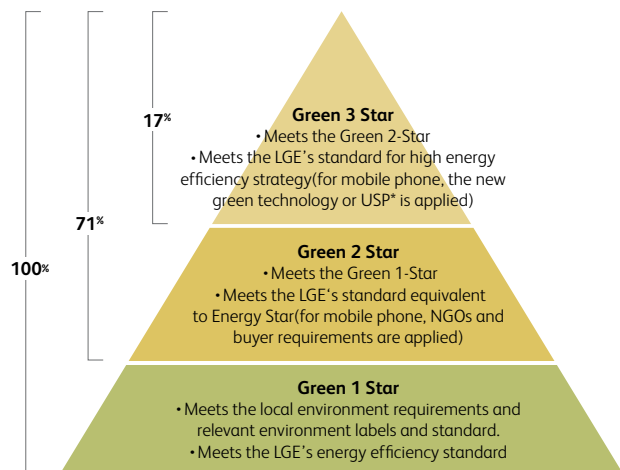
### LG Electronics' Green Product Strategy



### GREEN PRODUCT RATING SYSTEM : Eco-Index

**Eco-Index Rating System** • Eco-Index is LGE's own rating system which quantifies the eco design level of products in terms of their eco-consciousness, and it is used as the tool to manage their environmental performance and goal-setting. LGE meets, in advance, environment regulations such as Energy related product(EU ErP); and divided the product environmental performance rating to Green 1 Star, 2 Star and 3 Star to increase the portion of the products satisfying the relevant requirements(e.g., Energy Star). The rating system is described below. LGE will continue increasing the portion of products meeting the higher Eco-Index.

### Eco-Index Ratings and 2010 Rating Results



**Voluntary Replacement of Hazardous Substances** • All LGE products satisfy the EU RoHS requirements. LGE is also replacing the PVC and brominated flame retardants(BFRs) - which are not subject to the regulations but are known to have environmental impact - af-

### Replacement of Hazardous Substances

<b>Mobile Phone</b>	<ul style="list-style-type: none"> <li>• PVC replaced for all new models developed after January 2010</li> <li>• BFR replaced for all new models developed after January 2010, except for some components e.g., IC, transistor, etc.</li> </ul>
<b>TV</b>	PVC/BFR replaced for all 2011 newly developed models of insulation sheet and deco sheet; gradually replaced for individual components such as stand, front cabinet, bottom bracket, back cover, etc.
<b>Vacuum Cleaner</b>	PVC/BFR replaced for individual components such as hose, charger, battery, steam pipe, etc.
<b>Home Appliance</b>	PVC/BFR replaced for some electronic components such as cabinet, back cover, stand, packing, etc.

ter safety and reliability test for new PVC/BFR components. We already started replacing the halogen(Cl and Br) contained in the mobile phone PCB, headset and battery several years ago; after January 2010, halogen is not used in all newly developed mobile phones and starting in 2011, all models will be halogen-free. In addition, reduction is under way for ODD(Optical Disk Drive), laptop and LCD TV components. For more information, please visit the homepage: (🌐)

<http://www.lg.com/global/sustainability/environment/details-of-hazardous-substances.jsp>

**GREEN TECHNOLOGY**

Recognizing the impact of electronic products on the environment and human health, LGE announced environment management in 1994 to conduct R&D activities throughout the entire product life cycle so that the impact on environment can be reduced. The key R&D areas include energy efficiency, replacement of hazardous substances, design for improved recyclability, and infrastructure for developing greener products and technologies.

**Green Technology Certifications(by the Korean Government)**

Under the Green Technology Certification system introduced by the Korean Government in 2010, LGE acquired 11 certificates on home appliances, solar energy, LED lighting, etc. These technologies are applied to various products of LGE. For more information, visit the Korea Institute for Advancement of Technology website: (🌐 <http://www.greencertif.or.kr>)

**Green Technology Certifications**

Product	Technology
Refrigerator	High efficiency inverter linear compressor technology
	High efficiency parallel cooling system technology
Washing Machine	Technology for maximizing washing machine capacity using a fixed tub structure
	6-motion washing technology
	Dual injection steam washing technology
Air Conditioner	Ultra-power saving technology using a high efficiency inverter compressor and motion sensor
	High efficiency central air-conditioning system technology
Solar Energy	130-micron thin layer crystalline silicon solar cell technology
LED Lighting	LED flat lighting design technology of high efficiency and high color rendering
TV	High efficiency panel technology for PDP TV
Microwave Oven	Technology reducing the standby power down to 0.9W or less

**GREEN PRODUCT AWARDS AND CERTIFICATIONS**

As of November 2010, LGE products had been recognized with 2,253 certificates for green technology from organizations around the world. The major awards and certifications in 2010 include the following:

**CES 2010 Eco-Design and Sustainable Technology Award, U.S.**

LED LCD TV 47LE8500 received the U.S. CES 2010 Eco-Design and Sustainable Technology Award in U.S.



- Resource saved by 29.3 mm slim design
- Number of assembly screws reduced to increase recyclability
- Smart energy saving function (by 70% vs. traditional CCFL model)

**The UL Sustainable Product Certification(SPC), U.S.**

The monitor E2350V acquired the SPC, the UL green certification.



- Energy conservation by unique LED technology of LGE
- Resource saved by 17.5 mm slim design

**The Best “Eco-Chic” Product in MAISON & OBJET 2010, France**

The refrigerator GB7143A2HZ and GB7143AVRZ for Europe, which adopted linear compressor, was selected as a representative “eco-chic” in MAISON & OBJET 2010, France.



- High efficiency and energy saving function
- Capacity increased by 50 L compared to other product with the same dimensions.

**2010 EISA Green Mobile Phone Award, EU**

The ‘Pop’ phone received the European Imaging and Sound Association(EISA) Award as a green mobile phone.



- Use of recycled material
- Low energy consumption charger
- Solar charger battery pack(Sold as accessory)



**SELECTED GREENER PRODUCTS RELEASED IN 2010**

In 2010, LGE released various products using green technologies such as a hybrid solar air conditioner, refrigerator with a top energy efficiency rating in U.S., mobile phones with recycled plastic, and robot cleaners with improved energy efficiency and reduced noise.

<p><b>Energy efficiency enhancement</b></p> <ul style="list-style-type: none"> <li>• Inverter: Power saving function</li> <li>• Air purifier function operable by max 100 % solar energy; cooling function operable by up to 15 % solar energy vs. minimum power consumption</li> </ul> <p><b>Home environment</b></p> <ul style="list-style-type: none"> <li>• “Human Care Robot” : auto wind direction/volume/temperature control function through sensors</li> <li>• Green-tea HEPA filter    •Platinoid enzyme filter</li> <li>• Deodorization function</li> </ul> <p><b>Hazardous substances management</b></p> <ul style="list-style-type: none"> <li>• Meets EU RoHS requirements</li> </ul> <p><b>Awards &amp; Certifications</b></p> <ul style="list-style-type: none"> <li>• 2010 Green Technology Certification (Inverter and solar technology) - Korea</li> <li>• 2010 Energy Winner Award Grand Prix - Korea</li> <li>• 2010 Green Growth Brand - Korea</li> <li>• Carbon Footprint Label - Korea</li> </ul>	<p><b>Energy efficiency enhancement</b></p> <ul style="list-style-type: none"> <li>• High efficiency charger with standby power 0.03W and energy efficiency 70 % better than conventional charger</li> </ul> <p><b>Hazardous substances management</b></p> <ul style="list-style-type: none"> <li>• Meets EU RoHS requirements</li> <li>• No use of BFRs, PVC and phthalate</li> </ul> <p><b>Recyclability improvement</b></p> <ul style="list-style-type: none"> <li>• 76 % of recycled paper used for package box</li> <li>• Soy ink printing of package box and user manual</li> </ul> <p><b>Resource reduction</b></p> <ul style="list-style-type: none"> <li>• 30 % of recycled plastic used in battery cover</li> </ul> <p><b>Awards &amp; Certifications</b></p> <ul style="list-style-type: none"> <li>• Displayed in CES 2011 - U.S.</li> </ul>
<p><b>Energy efficiency enhancement</b></p> <ul style="list-style-type: none"> <li>• North America energy efficiency rating - Top tier level *</li> <li>• High-efficiency linear compressor</li> <li>• High-efficient/high-luminous LED lighting</li> </ul> <p><b>Resource reduction</b></p> <ul style="list-style-type: none"> <li>• Recycled plastic used (PP and ABS material, 1kg/unit)</li> </ul> <p><b>Hazardous substances management</b></p> <ul style="list-style-type: none"> <li>• Meets EU RoHS requirements</li> <li>• Eco-conscious foaming agent, cyclopentane** adopted</li> </ul> <p><b>Awards &amp; Certifications</b></p> <ul style="list-style-type: none"> <li>• 2010 Green Technology Certification (Linear compressor technology)</li> </ul>	<p><b>Energy efficiency enhancement</b></p> <ul style="list-style-type: none"> <li>• Energy saving</li> <li>- On-mode: 18W    - Power-saving mode</li> <li>• Reduce cleaning time using “Dual Eye” sensor</li> <li>• Li-ion polymer battery</li> </ul> <p><b>Home Environment</b></p> <ul style="list-style-type: none"> <li>• Reduce noise level to 50dB</li> <li>• HEPA filter</li> </ul> <p><b>Hazardous substances management</b></p> <ul style="list-style-type: none"> <li>• Meets EU RoHS requirements</li> </ul> <p><b>Awards &amp; Certifications</b></p> <ul style="list-style-type: none"> <li>• Displayed in CES 2011 – U.S.</li> </ul>



FQ232LASS  
Hybrid solar air conditioner



LG-VN270  
Mobile phone using recycled plastic



LFC21776ST  
Top tier refrigerator



VR5902KL  
Robot Vacuum

\* Top tier level : The efficiency level higher than the Energy Star requirements of US EPA (varies per product; 10% for refrigerator)  
 \*\* Cyclopentane : A substitute for CFC and HCFC

**REINFORCEMENT OF GREEN PARTNERSHIP**

**Green Program Plus - Green Supply Chain Management** • The Green Program Plus(GP Plus) is a proprietary LGE program intended to contribute to the green competitiveness of suppliers and joint growth by providing them with LGE’s know-how. In 2010, based on the Green Program, which was launched in 2005 to address the requirements on hazardous substances contained in products. GP Plus was expanded to include second and third-tier suppliers and incorporate greenhouse gas control, CSR support, etc.

LGE validates new suppliers’ green management capabilities, and existing suppliers are managed through follow-up procedures. New candidates are assessed for their environmental management level, control of hazardous substances, control of green materials/products, and existing suppliers are examined to check if their components comply with LGE’s standards that are recommended to voluntarily manage hazardous substances specified by NGOs, etc. in addition to those defined by LGE in the context of global environmental protection.

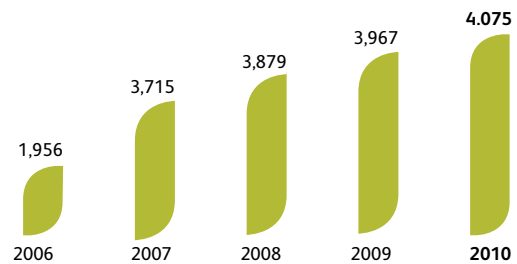
**Green Program Plus / Assessment Criteria for Suppliers**

Screening of New Supplier		Follow-up Screening	
Environmental Management System	20	Hazardous Substances Management	55
Hazardous Substances Management	50	Management of 2nd-tier Suppliers	15
Material/ Product Management	30	Inspection & Validation	30
		Voluntary Phase-out of PVC/BFR	5(extra score)

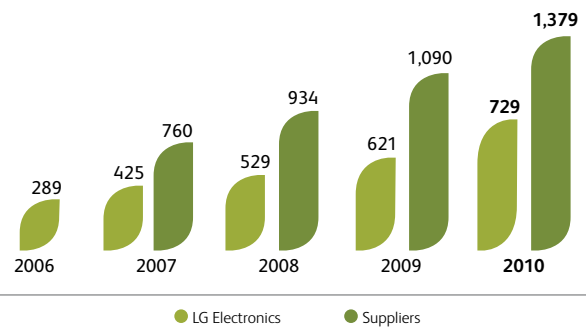
**Expert Training Program for Suppliers** • Since December 2006, LGE has been conducting expert training programs for hazardous substance control policy and LGE’s green policy to suppliers throughout the supply chain.

In 2011, we have plans to open an expert course on GHG management and hazardous substance measurement, as well as provide training opportunities to second and third-tier suppliers.

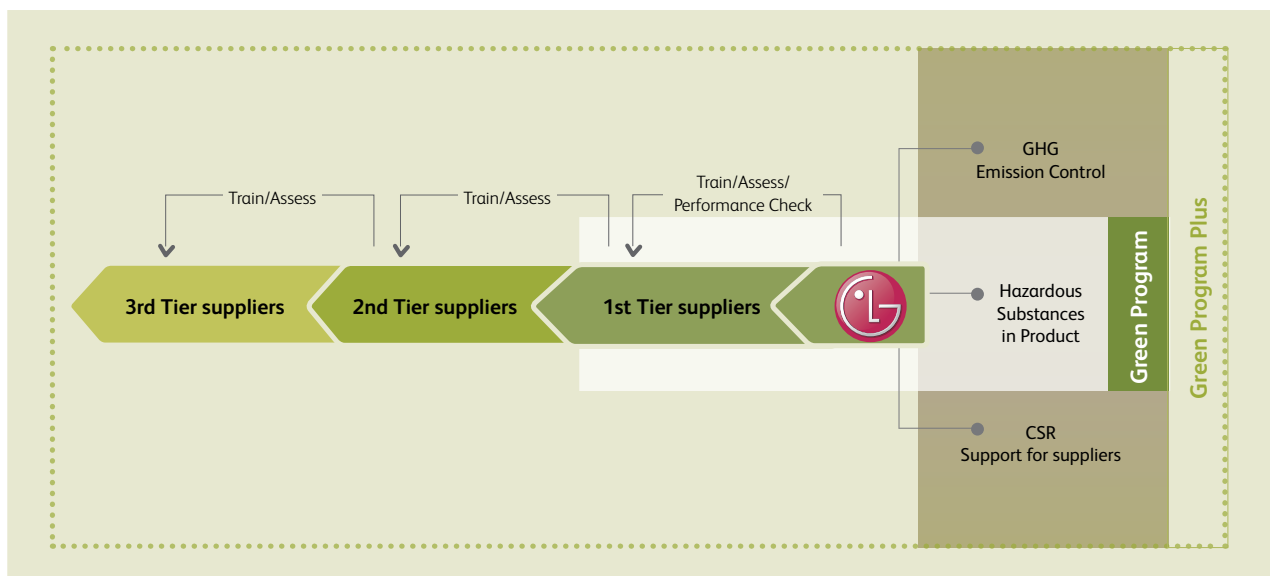
**No. of Green Certified Companies(Cumulative)** Unit : No. of Supplier



**No. of Certified Auditors(Cumulative)** Unit : People



**LG Electronics’ Green Program Plus**





**Low-Carbon Procurement** • LGE is planning to construct a low-carbon supply chain by implementing low-carbon procurement from suppliers who actively participate in the GHG reduction. The low-carbon purchase is intended for selection of preferred suppliers who have the GHG reduction objectives, and the purchase volume will reach KRW 50 trillion in 2020. We will gradually provide suppliers with GHG inventory and monitoring system setup, third party validation, GHG reduction know-how consulting and training services to support their low-carbon green management.

**Green Win-Win Growth MOU with Suppliers** • In November 2010, we concluded a MOU with 3 suppliers on the use of eco-magnesium and carbon credit for green win-win growth. Through the MOU, suppliers will benefit from the expanded sales channels, improved productivity, and carbon credit business know-how; and LGE will benefit from the green technologies of suppliers.

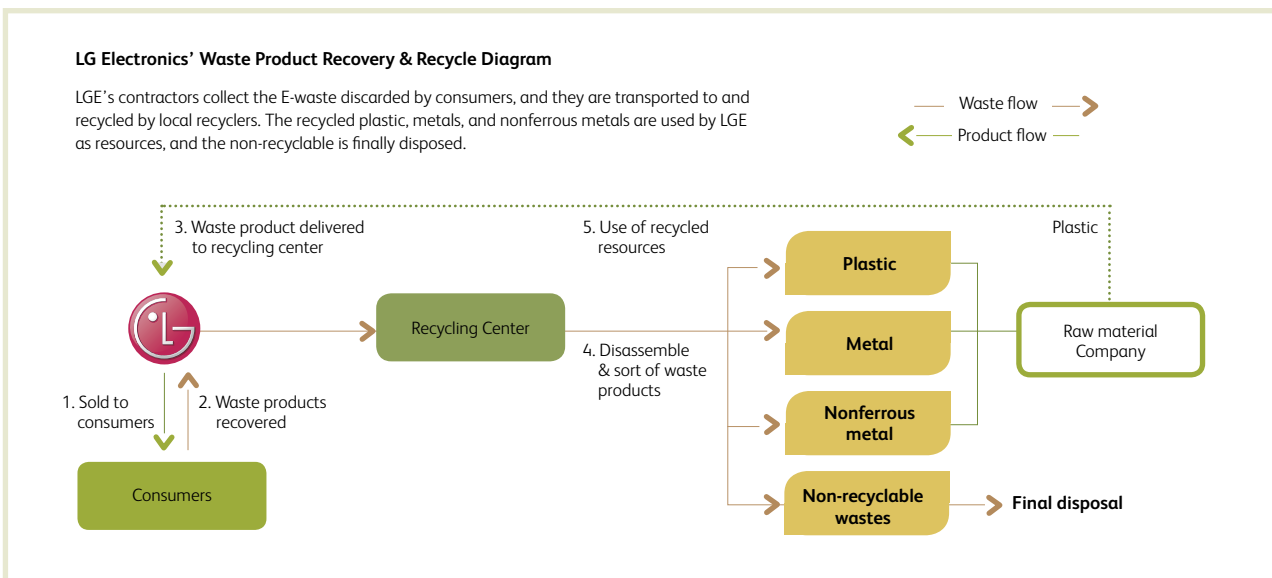
**E-Waste Take-back System and Recycling** • LGE is proactively responding to the EU Waste Electrical and Electronic Equipment (WEEE) regulations and e-waste regulations around the world. It not

only collects waste products based on local regulations and requirements, but is also establishing a take-back system through collaboration with local partners( <http://www.lg.com/global/sustainability/environment/take-back-recycling.jsp>).

LGE is also conducting research on take-back management in some non-regulated areas. To satisfy the WEEE requirements in China slated to take effect July 2011, it is preparing a take-back system jointly with the Chinese government and industrial associations. In addition to this, the company is participating in the Great American Cleanup event of KAB<sup>\*</sup> starting March 1, 2011.

In Korea, in addition to the operation of its own recycling center, it collects other e-waste generated in several provinces(MOU with local governments: Geoje city, Ulsan city). To improve resource efficiency across the entire process, LGE has adopted and applied recyclability criteria from the product design stage. The take-back performance of LGE and selected countries is as shown below.

\* KAB(Keep America Beautiful): The environmental organization in U.S. founded in 1953, focusing on community improvement. KAB holds the Great American Cleanup event where about 4 million people participate every year, engaging in various activities e.g., waste prevention & management (reduction, reuse and recycle) and community forestation.



**Global E-Waste Take-back and Recycling Results**

Unit: Ton

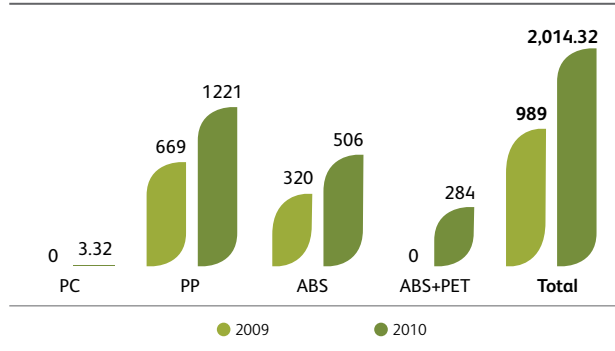
Country	2006	2007	2008	2009	2010
Korea	30,959	37,016	32,540	38,542	<b>43,412</b>
Japan	1,257	2,250	3,570	4,247	<b>3,603</b>
Europe	24,140	38,141	71,090	122,358**	<b>148,284*</b>
North America	124	277	935	2,330	<b>3,685</b>
<b>Total</b>	<b>56,480</b>	<b>77,684</b>	<b>108,135</b>	<b>167,477**</b>	<b>198,984</b>

\* Due to the different reporting system in Europe, some figures are estimated on their own or neighborhood country performances. As a result, data in the next year's report can be changed.

\*\* The figure for 2009 Europe performance was corrected from 107,041 to 122,358 to reflect the actual performance of Greece, Denmark, Romania, Slovakia, UK, Czech, Portugal, Poland and France.

**Types and Usage of Recycled Plastic**

Unit: Ton



**Use of Recycled Resources**

LGE uses recycled materials (e.g. recycled plastic) for resource recycling in addition to management of e-waste. Recycled polypropylene (PP) and acrylonitrile butadiene styrene (ABS) accounts for 667 tons from the 625,000 tons of plastic used in 2009. In 2010, LGE used total 2,014 tons of recycled plastic: 3.3 tons of polycarbonate, 1,221 tons of PP, 506 tons of ABS and 284 tons of ABS+PET.

\* The recycled plastic only refers to the post consumer plastic.

**FUTURE DIRECTION**

- Continue to introduce greener products
- Provide customers with product environmental performance
- Establish a global take-back system
- Develop technologies for recyclability



**COLLECTION & PROCESSING OF WASTE ELECTRONIC PRODUCTS OF LGE (IN EUROPE)**

Daniel Seager,  
Environmental Specialist  
LGE European Standard Center

**How do you collect and process waste electronic products from LGE in the EU region?** The WEEE Directive in Europe requires producers to organise and finance the collection, treatment, recovery and environmentally sound disposal of WEEE. At LGE Europe we take our WEEE responsibilities very seriously since we believe that recycling and the recovery of resources plays a significant role in contributing to sustainable development. In order to meet our obligations, LGE Europe has either jointly founded or partnered with 24 take-back compliance systems in 21 countries and is compliant with the national WEEE regulations in all countries where a producer obligation exists. The current process of WEEE take-back in Europe varies from country to country, but in principle, through membership with our take back systems, LGE finances the collection, treatment, recovery and environmentally sound disposal of WEEE from private households deposited at local collection centers.

**How many waste electronic products do you collect and process in EU region?** LGE collected about 122,358 tons in 2009 and 148,284 tons in 2010, up by 21.19%. The recovery volume is increases gradually every year.

**What's your plan in EU region regarding collection and processing of the waste LGE electronic products?** Unfortunately a lot of elec-

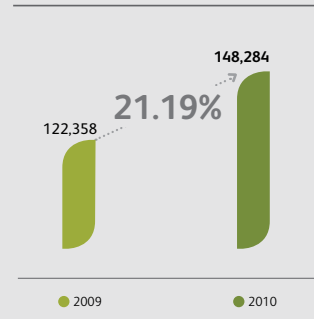
tronic waste still ends up in landfill sites where it cannot be recycled. LGE are working with our partner WEEE schemes to increase public awareness of the importance of recycling WEEE. In the future we hope to see less WEEE entering landfill sites and more WEEE being separately collected and properly treated so as to further reduce the environmental impact of our products.

LGE is also involved with industry associations in Europe which advise policy makers of the importance of achieving better take-back regulations so as to improve the collection and recycling systems in Europe.

LGE will continue to meet all its obligations under the current, and future WEEE regulations and will strive to optimise the take-back process through enhanced partnerships with recyclers and take back-schemes in Europe.

**Waste Products Collected by LGE in EU region**

Unit: Ton



\* 2010 data is preliminary so it is subject to change



Photo of the Remondis, a recycling partner in LGE German Subsidiary



# Low-Carbon Green Management

LG Electronics has established a low-carbon green management system to provide low carbon value to customers through voluntary greenhouse gas(GHG) reduction. Throughout its activities, LGE is endeavoring to pursue the coexistence of the two major values: creating value for customers and stakeholders, and protecting the natural environment.

## OUR APPROACH

- **Manage climate change risk and exploit opportunities**
- **Establish long-term GHG reduction plan**
- **Reinforce 4 major strategies against climate change**
- **Establish low-carbon supply chain management**

## OUR PERFORMANCE

### ESTABLISHMENT AND EXPANSION OF LOW-CARBON GREEN MANAGEMENT

**Voluntary GHG Reduction Target Announcement** • LGE announced its voluntary GHG reduction target in January 2009. The company established a goal to reduce its GHG emissions from manufacturing level by 150,000 tons, equivalent to 10% in 2020 compared to the 2008 baseline(cumulative reduction from 2008 to 2020 is around 1 million tons). For reduction of emissions during product use phase, we set a reduction target of 30 million tons of GHG emissions from the BAU\* in 2020(cumulative reduction from 2007 to 2020 in approx. 200 million tons). To achieve its target, LGE pursues various GHG reduction activities, including manufacturing process innovation, facility improvement, operation improvement, and renewable energy use, and maintains its efforts to develop high-efficiency products.

\* BAU: Business As Usual. Projected GHG emission based on the assumption that the GHG reduction technology and policy are maintained to the current level.

**Low-Carbon Green Management Strategy** • LGE is conducting an enterprise-wide low-carbon green management strategy to provide low carbon value to customers through voluntary GHG reduction. The low-carbon green management strategy is based on 4 major themes: production level GHG reduction through productivity enhancement, product usage level GHG reduction through energy efficiency improvement, business-wide GHG reduction and management, and enhancing social responsibility through the establishment of low-carbon culture.

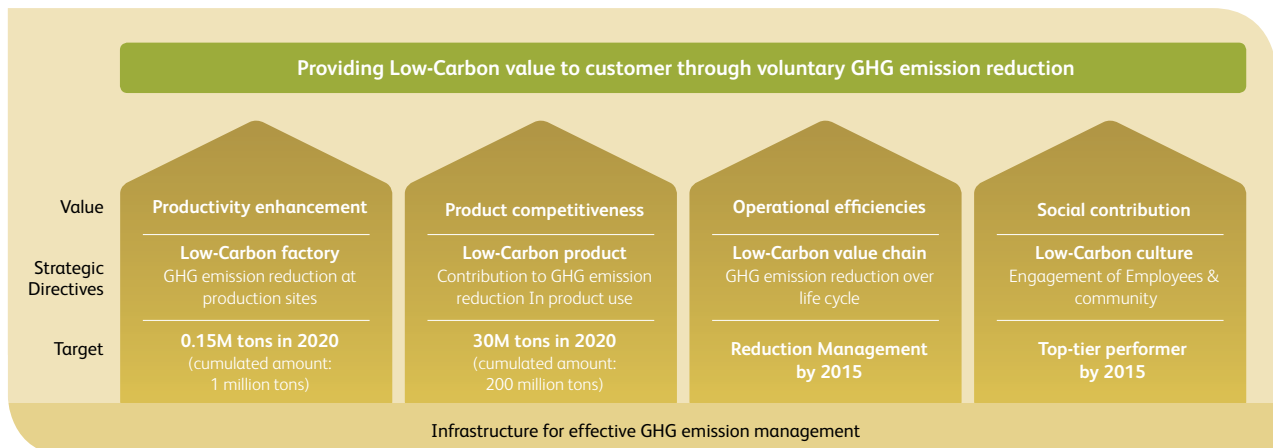
### Low-Carbon Green Management System Establishment

**GHG Inventory Setup** Having completed the GHG inventory setup for its all 12 Korean operations in 2008 for the first time among Korean electronic companies, LGE expanded and completed the GHG inventory setup for its all 29 overseas manufacturing sites in 2009. The company is currently conducting systematic management of its GHG emissions through the Corporate Carbon Management System (CCMS), a GHG management IT system.

To ensure the reliability of data, LGE engages third-party verification. In 2010, the company completed the third-party validation on its 13 manufacturing sites in China.

**Low-Carbon Green Management System** LGE has been managing reduction of GHG in production levels and product usage levels as the company's primary business objective since late 2008. For the low-carbon green management, GHG reduction status is reported to top management team periodically by the Eco Strategy Team. Moreover, LGE has established an Eco-Design Committee, chaired by the Chief Technology Officer and consisting of executives from R&D de-

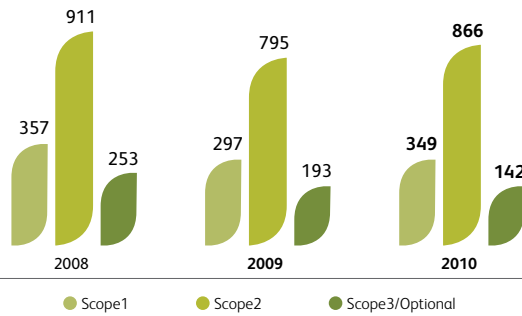
### LG Electronics' Low-Carbon Green Strategy



partments. In the Committee, executives examine and monitor the progress of development for energy-efficient products and technologies, and evaluate the carbon footprint of product at the R&D phase. The 14th committee was held on May 2010.

**GHG Inventory**

Unit: K ton CO<sub>2</sub>-e



- The data include 12 Korean operations and 29 overseas manufacturing operations.
- Calculation Standard : 2006 IPCC Guideline, WRI GHG Protocol
- Scope 3 : Commute Shuttle, lease building (exclude offices smaller than 100 employees work)
- Optional : Refrigerant R-22, Firefighting facilities, Halon, etc.
- The total GHG emissions could be slightly changed after the 3rd party verification.

**Risk and Opportunity of Climate Change** • LG Electronics is conducting corporate-wide measures to minimize the risks from climate change.

**Climate change : Risks and Countermeasures**

Standpoint	Risk	Measure
<b>Regulatory</b>	<ul style="list-style-type: none"> <li>- Stricter energy efficiency standards</li> <li>- GHG &amp; Energy Target Management System by Korean government</li> <li>- Total greenhouse gas emission regulations</li> <li>- Expansion of product's carbon footprint disclosure</li> <li>- Economic measures including carbon tax, border tax, etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Manage energy technology roadmap, develop high energy efficient technology</li> <li>- Complete inventory buildup, conduct third-party verification every year</li> <li>- Set and execute voluntary GHG reduction target</li> <li>- Operate GHG management IT system, perform LCA</li> </ul>
<b>Physical</b>	<ul style="list-style-type: none"> <li>- Production instability due to natural disasters</li> <li>- Worsening employee health</li> </ul>	<ul style="list-style-type: none"> <li>- Enhance safety management system and risk evaluation</li> <li>- Conduct total health program, improve response capability</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>- Cost increases due to stricter regulation, supply and demand instability etc.</li> <li>- Production instability due to supply chain's functional impairment</li> <li>- Lower product consumption due to the impact of climate change</li> <li>- Stricter company evaluation from investors, NGOs, etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Conduct raw material cost analysis, manage the supply chain</li> <li>- Establish low-carbon supply network</li> <li>- Conduct CSR activity, including appropriate technology</li> <li>- Enhance public communication</li> </ul>

**Climate change: Exploiting opportunities**

Standpoint	Opportunity	Measure
<b>Regulatory</b>	<ul style="list-style-type: none"> <li>- Stricter energy efficiency standards</li> <li>- Expansion of renewable energy usage rules</li> <li>- Initiation of greenhouse gas emissions trading schemes</li> <li>- Increased new business opportunity owing to the green growth policy</li> </ul>	<ul style="list-style-type: none"> <li>- Develop high energy efficient products, national incentive systems</li> <li>- Develop solar cell technology, expand production</li> <li>- Initiate CDM business for high energy efficient refrigerators</li> <li>- Smart grid, LED, geothermal heat pump, etc.</li> </ul>
<b>Physical</b>	<ul style="list-style-type: none"> <li>- Unusual temperature due to climate change</li> <li>- Worsening of water deficit and pollution</li> <li>- Increase of yellow dust</li> </ul>	<ul style="list-style-type: none"> <li>- Enhance the development of high energy efficient air conditioning technology</li> <li>- Reinforce the water purifier, water ionizer and water processing business</li> <li>- Reinforce the air conditioning and air purifier business</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>- Increase of low-carbon product consumption</li> <li>- Enhanced brand and company image</li> <li>- Expansion of product's carbon footprint disclosure</li> <li>- Energy efficiency improvement through process innovation</li> </ul>	<ul style="list-style-type: none"> <li>- Enhance the development of low-carbon product technology</li> <li>- Expand external communication</li> <li>- Expand voluntary carbon label acquisition</li> <li>- Share CO<sub>2</sub> reduction results through energy efficiency improvement</li> </ul>

**GHG reduction performance in 2010**

Unit: K ton



- To calculate the direct use phase emission, LGE utilizes specific scenarios for customer's product usage by each product. Customer usage scenarios are basically calculated with power consumption, average product usage time, and so on.

**Production Level GHG reduction** • LGE set its target to reduce 100,000 tons in production levels of GHG in 2010 compared to 2008, and achieved a 160,000 ton GHG reduction through diverse activities, including production facility/operation improvement and the energy conversion. Below are the company's main activities to reduce the production level GHG.

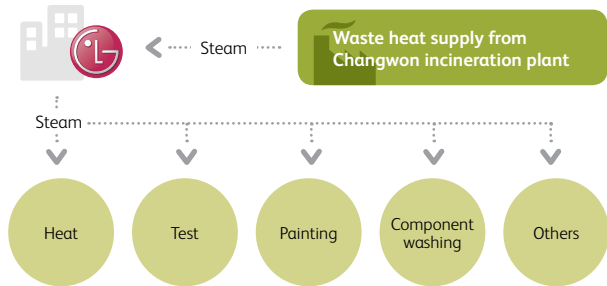
**Facility and operation improvement** LGE achieved a yearly GHG gas reduction of approximately 20,000 tons by improving the energy efficiency of compressors and air handling units, respectively used in the manufacturing facilities of air conditioners as well as household appliances and mobile phones.

**Incineration waste heat recovery system** LGE's Changwon factories invested approximately KRW 7.2 billion to establish a steam supply system operating with waste heat from the incineration plant



of the city. With the introduction of the new system, the company achieved a yearly reduction of 10,000 tons of GHG emission and KRW 3.1 billion of energy consumption compared to the previous LNG system.

**Incineration waste heat recovery system**



**Product Usage Level GHG Reduction** • In 2010, LGE announced its plan to reduce 6 million tons of GHG in the product usage level compared to the 2007 power consumption. The company contributed to 12.75 million ton reduction of GHG through high-efficiency technology development, R&D investment, and low-carbon products.

**Promoting low-carbon consumption through carbon disclosure**

LGE provides carbon footprints of its products with the 3rd party certification. Based on the lifecycle carbon footprint, the company makes efforts to reduce the GHG emission in each required step. In 2008,



**Products with Carbon Footprint Label**

Model	Date of Certification
Commercial electric heat pump -heating/cooling outdoor unit(LRP-N4108D)	August 2010
Vacuum cleaner(VC6860LHAY)	July 2010
Light wave steam oven(MP929NPS)	July 2010
Refrigerator(R-T759MHHGP)	June 2010
Mobile phone(LG-SU430)	June 2010
Air conditioner(FNQ182FASV[FUQ182FAU])	May 2010
LED LCD TV(47SL90QD)	February 2010
Drum washing machine(FR3228WA)	March 2009
Washing machine: motor(WDC246Y01S)	December 2009
Air conditioner: inverter compressor(GKT176DAA)	December 2009
Air conditioner: compressor(GJT240DAA)	November 2009
Refrigerator: linear compressor(FC140NEM)	November 2009

• Source: Korea Environment Technology & Industry Institute (<http://eng.keiti.re.kr/>)

the company’s washing machine(model FR3228WA) received the industry’s first certification from the Carbon Footprint Label program conducted by Korea Environmental Industry & Technology Institute (KEITI). Currently, the company endeavors to expand its carbon labeling certification to other products, including TVs, refrigerators, and air conditioners. In 2010, owing to voluntary carbon disclosure efforts, LGE received a total of 12 carbon footprint labels for its components and products.

**GHG Reduction for the Whole Product lifecycle**

**Logistics GHG reduction target** After establishing the GHG reduction target in production levels and product usage levels, LGE announced its goal to further reduce GHG emissions respective to the transportation distance of each unit weight by 1 % compared to the previous year. In October 2010, the company participated in the vehicle logging device project conducted by the Korea Transportation Safety Authority(KOTSA) to improve the calculation accuracy of the GHG emission during the transportation. The company aims to establish green logistics through modal shifts, energy usage optimization, and employee awareness.

**Low-Carbon Culture**

**GHG reduction activity** In late 2009, LGE Labor Union announced its official establishment of the Union Social Responsibility(USR), and set as its primary objective the expansion of low-carbon culture against climate change. The company published a volume of GHG emitted during major events, and conducted various activities such as tree plantings to offset GHG emissions. Owing to these efforts, the company was awarded the Carbon Neutral Certification from Korea Energy Management Corporation(KEMCO). In addition, the company introduced a low-carbon food menu for employees to induce their awareness on the climate change, and organized a green idea competition to collect employees’ ideas for energy and carbon reduction. The best ideas will be selected and implemented in actual work environments.



1. Carbon neutral tree planting event  
 2. USR low-carbon campaign  
 3. Low-carbon menu campaign  
 4. Low-carbon labor union officers' athletics day

**Online Climate Change Training** • In 2010, LGE expanded the online climate change training previously conducted for all Korean employees in 2009, to overseas employees. The online training, conducted in North America, China and EU regions with the participation of about 20,000 employees worldwide, was intended to promote the awareness of climate change and share LGE's measures against the environmental impact. The program acclaimed with an approximate 76% satisfaction rate.

### Carbon Credit Business

**Approval of CDM business in India** LGE is proceeding with the Clean Development Mechanism(CDM), acquiring carbon credits through sales of high energy efficient refrigerators. The company's initiative was approved by the Indian government in April 2010, marking LGE the world's first company to obtain the approval of CDM through the production of high energy efficient refrigerators (AM0070).

**Sales of low-carbon refrigerators to low income families** In August 2010, LGE participated in the old refrigerator replacement program as a part of Korea Energy Foundation's "low income families energy efficiency improvement project" and supplied 3,000 high energy efficient, refrigerators to low income families. The replacement of low income families' old refrigerators with LGE's high-efficiency refrigerators will yield a yearly reduction of 1,260MWh of energy consumption and 850 tons of GHG. The Korea Energy Foundation has been conducting third-party verification since 2010 to register the carbon reductions obtained through its project as a voluntary carbon credit business under the Voluntary Carbon Standard(VCS).

### Enhancing Cooperation

**Conclusion of cooperation agreement** LGE further enhanced cooperation with external organizations to expand its low carbon green management and strengthen its capability to respond to the climate change. The company signed an agreement with Korea Environmental Industry & Technology Institute in July 2010 to promote the participation and establishment of the Carbon Footprint Label program. In October 2010, LGE concluded an agreement with the Korea Environment Corporation to better respond to GHG restrictions.

It also concluded an agreement with three business partners to promote "green" win-win growth(See page 41) and reinforce the carbon credit business.

**Expansion of Voluntary Efforts** • LGE is actively participating in activities developed by international organizations, including the UN, to fulfill its corporate responsibility towards resolving the climate change issue. In April 2010, the company subscribed to Caring for Climate, one of the initiatives of UN Global Compact, and is currently participating as a member of the steering committee to represent Korean companies. It is also participating in the Electronic Industry Citizenship Coalition(EICC)'s Environmental Sustainability Work Group in joint efforts with the electronic industry to enhance sustainability.

### Join Carbon Green Management Leaders Club by Korea CDP

• LGE was recognized for its low carbon green management and its efforts to respond to the climate change and create low carbon customer value, which yielded a high evaluation score from renowned external organizations. Since 2008, LGE has been participating in the Carbon Disclosure Project(CDP) to enhance corporate sustainability and increase socially responsible investment through low carbon green management. Since the best prize award in 2009, the company has joined by the Carbon Management Global Leaders Club as one of the top Korean companies with outstanding carbon disclosure and reduction performance, demonstrating its leadership in low-carbon green management.

### NEW ENVIRONMENT-ENERGY BUSINESS

**Solar Solution** • Solar power is LGE's new energy business. The company manufactures solar cells and modules based on its 25 years of accumulated expertise in the research and development of solar power. LGE has established a solar module test center, certified as the official test center by the Europe certification body(TÜV Rheinland) and U.S. certification body(UL).

The company has also installed its solar modules at the Gumi 1 Site. Solar power provides up to 20-30% of electricity used in the administration offices. LGE plans to expand its solar power production to 330MW in 2011, and is furthering its efforts in increasing production capacity and in research and development to achieve a revenue goal of KRW 300 million by 2015.



1. Conclusion of cooperation agreement against climate change with Korea Environment Corporation  
2. Solar panel installed in Gumi 1 site's parking lot



**Lighting system** • LGE is currently in development and production of the energy efficient Light Emitting Diode(LED) lighting system and the Plasma Lighting System(PLS) adapted from the plasma emission principle. The company's LED lighting products have received the High Efficiency Energy Equipment Certification from the Korea Energy Management Corporation(Ministry of Knowledge Economy), and its LED flat panel lighting design technology awarded the Green Technology Certification. Also, the company's PLS received two quality certifications from China Quality Certification Center, the indoor lighting system quality certification and the floodlight quality certification.



**Total HVAC System** • LGE provides a total HVAC system, an optimized Heating, Ventilation and Air Conditioning solution adapted to the condition of the site during the building's construction and/or renovation design. The system employs LGE's inverter technology to provide automated control according to the cooling/heating condition and reduce energy consumption. The company is also engaging in the development of green buildings through its line of products using renewable energy, such as "hybrid XEO", which uses geothermal energy.

**Smart Grid Business** • A smart grid, also known as the next generation intelligence power network. It also requires the application of new intelligent technology to the existing electricity network. It also allows utilities and consumers to communicate in real time using two-way digital technology to optimize energy efficiency. LGE has been developing home network technologies and releasing remote controlled products since the early 2000s. Since 2009, the company has participated in Korean government-led smart grid pilot projects as a consortium-leading company. LGE opened the Jeju Smart Grid Showroom where customers can stay in and experience smart grid technologies and appliances. LGE has also been participating in the smart grid pilot project (Smart Watts) led by Achen, Germany, and in

the household charger/discharger pilot project(SCE) jointly with LG Chem in North America region.



**Water Treatment Business** • With plans to foster a water treatment business as a future growth engine, LGE will invest over 500 billion KRW over the next 10 years starting from 2010.

In 2010, LGE developed new water treatment technology in collaboration with GS Neotek and Korad, which was awarded the Environmental Technology Certification from the Korea Environmental Industry & Technology Institute(KEITI), led by the Ministry of Environment. The Company registered two patents and applied five patents related to its new water treatment technology in Korea, and is preparing an international patent application as well.

## FUTURE DIRECTION

- Create low-carbon customer value through voluntary greenhouse gas reduction
- Foster and expand new green business
- Expand the greenhouse gas reduction to the whole value chain
- Enhance social responsibility through the expansion of low-carbon culture

# EESH Management

## OUR APPROACH

- **Mid and long term strategies: Integrate global EESH management and Develop EESH risk management system**
- **Mid and long term action plan**
  - **Energy:** Reduce energy consumption, secure reliable supply of utilities, reduce CO<sub>2</sub>
  - **Environment:** Decrease environmental pollution, reduce environmental management cost, promote environmental protection activity for local community.
  - **Safety:** Manage industrial safety prevention system and Incident Rate(IR), fire risk mitigation and prevention
  - **Health :** Reduce potential occupational illness through Total Health Program(THP), improve working environment

## OUR PERFORMANCE

### KEY STRATEGIC OBJECTIVES FOR EESH IN 2010

#### Develop a globally integrated EESH management system

1. Implement EESH strategy that aligns with corporate policy
2. Develop integrated certification of management system for worksites in Korea
3. Develop a global audit system platform
4. Hold Global EESH Conferences

#### Develop an EESH risk management system

1. EESH activity innovation
2. Hold a Best Practice(BP) expo for first-aid and fire prevention
3. Develop emergency evacuation process for high-rise buildings

**Key Strategic Goals for EESH in 2010** • Based on the corporate management philosophies of “Respecting Human Dignity” and “Creating Value for Customers”, LGE has established the EESH Code, the guideline for EESH activities, that corresponds to the global scale of LGE in 2007 and has been applying the codes ever since. In 2009, various standards for each worksite were integrated and reorganized as a single standard and distributed to all the business divisions to be uniformly applied. In 2010, all the activities for environment, safety and health, as well as the certification of management system were revamped to be consistent which resulted in work efficiency and created synergy effects. However, there was some confusion during the implementation stage and LGE is planning to

strengthen the operation system, review integration of certification of management system for overseas sites, and reorganize the audit system in 2011.

In 2010, the ISO 14001 and OHSAS 18001 systems for all worksites and R&D centers in Korea were integrated to establish a platform for building uniformed EESH strategy. In addition to this, the global capabilities of the EESH managers were enhanced by sharing best practice among worksites as well as conducting technical seminars at the biannual global EESH conference.

LGE also developed an emergency evacuation system at the R&D centers to minimize injuries in case of fire. LGE applied the evacuation simulation for high-rise buildings and conducted actual evacuation exercises to identify potential problems that may occur in real situation and performed improvement activities.

### The 2nd Global Conference for Enhancing the Capacity of EESH Managers

• LGE held the 2nd Global EESH Conference at the Pyeongtaek Learning Center in May 2010, participated by over 200 EESH managers from Korea and overseas. Participants discussed ways to protect the environment, reduce energy consumption, and improve safety activities. They also presented best practices and held technology seminars which improved the awareness level and formed consensus as the global enterprise. Participants were also educated about the Global EESH Management System initiated by headquarters. The conference provided an opportunity for LGE to integrate global EESH activities.

In addition, managers from overseas subsidiaries visited a recycling center in Korea and learned about the advanced recycling system. EESH managers underwent various training programs for each worksite to improve their capabilities. In particular, this conference focused on introducing new technologies and enhancing the capabilities of managers, which resulted in increased NPS index among participants compared to the 1st Conference held in 2008(75% in 2008 → 78.2% in 2010).

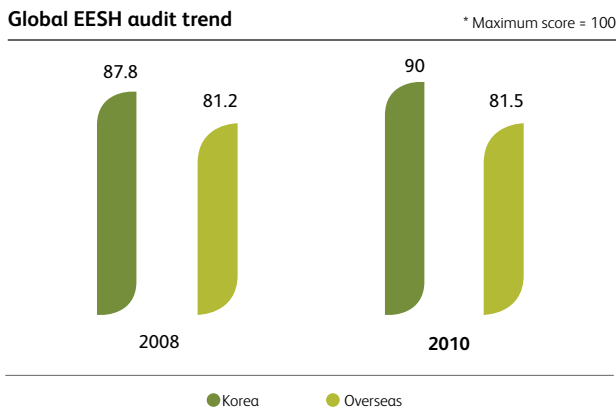
2nd Global EESH Conference





LG Electronics is realizing its vision to become Top Global Company in Energy, Environment, Safety, and Health (EESH) by operating corporate-wide EESH Management System, optimizing energy efficiency applying cleaner production, and improving occupational health and safety.

**Development of EESH Audit System Platform** • LGE has conducted an annual EESH audit from July to October for all worksites (36 sites) globally since 1996. The global EESH audit is conducted to reduce EESH risks at worksites by discovering best practices and performance evaluation. The selected outstanding sites are recognized and awarded each year by the CEO. In 2010, the Gumi production site in Korea and Noida site in India were selected as the most outstanding sites. From the audit process in 2010, LGE learned that it needs to apply an audit checklist that corresponds to newly changing global standards and to nurture qualified auditors. In 2011, LGE is planning to develop a new platform for the global EESH audit system including new checklist and internal auditor training program.



• Internal evaluation is conducted annually but the headquarters' evaluation is conducted biannually.

**Structure of Global EESH audit checklist**

<b>Plan</b>	1. Policy & Leadership
	2. Goal & Plan
	3. Organization / Accountability
	4. Risk Management
	5. Training & Exercise
<b>Execution</b>	6. Response to Emergency
	7. Document Management
	8. Communication
	9. Operation & Management (Energy, Environment, Safety, Health, Fire Prevention, Suppliers)
<b>Measurement</b>	10. Investigation & Analysis
	11. Evaluation & Improvement Management
<b>Improvement</b>	12. Management Review

**Integrated Certification of EESH Management System(in Korea)**

• LGE was the first Korean electronics company to establish a corporate-wide integrated certification system for Environmental Management System(ISO 14001) and Occupational Health and Safety Management System(OHSAS 18001). These were independently established for each worksite. As headquarters integrated and managed certification for six worksites and five R&D centers under a single system, each site's performances can be compared and monitored effectively. Most of LGE's overseas production sites have acquired ISO 14001 and OHSAS 18001 certification. Of 30 overseas offices, 28 have already acquired the ISO 14001 and 21 have acquired the OHSAS 18001(See page 82). The production site in Russia is expected to obtain certification in 2011, and the site in Saudi Arabia is expected to acquire certification in 2012.



**Development of Fire Evacuation Drills and Simulation System for High-Rise Buildings**

• LGE has developed an emergency evacuation system in five R&D centers in high-rise buildings and has been implementing the system. Specifically, employees at the Seocho R&D Center participated in fire evacuation drills in cooperation with the Seocho Fire Department. LGE and the fire department analyzed various situations that may occur in a high-rise building through the pre-evacuation simulation to identify the evacuation process. As a result, full evacuation could be completed within 21 minutes, which is 4 minutes shorter than the simulation.

**A FIRE EVACUATION DRILL AT SEOCHO R&D CENTER**



**Best Practice Expo for First-aid and Fire Prevention** • Environment & Safety Group at headquarters held a Best Practice(BP) expo for first-aid and fire prevention. A total of 11 teams participated in the expo and shared BP for fire prevention at each business site. The expo was focused on proliferating the BP and improving the employees' capability in handling emergency situations. The event was centered not on the professionals but on the employees, which increased employee awareness. The BP expo was held for the first time in an attempt to share know-how between employees at each site and the Fire Prevention Center. LGE is planning to hold the BP expo for first-aid and fire prevention every year to improve crisis management capabilities of employees at all the worksites.



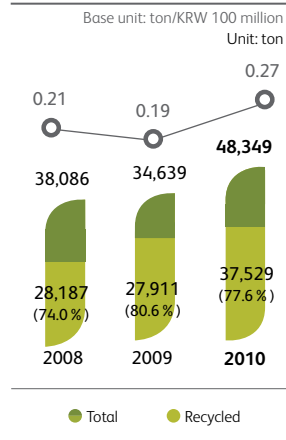
**ACTIVITIES OF PRODUCTION SITES**

**Energy** • LGE has been continuously implementing energy conservation and GHG reduction activities. In 2010, some production sites implemented a pilot energy management system to strengthen monitoring and systematic management of energy conservation activities. Particularly, the Noida plant in India received the world's first EN 16001 certification from the British Standards Institution(BSI). In Korea, the Changwon II plant and Pyeongtaek site received the energy management system certification, from Korea Energy Management Corporation and BSI, respectively. In 2011, LGE is planning to establish an energy management system for the Changwon I plant and Gumi site and prepare for the certification. In addition to such activities, LGE is continuously making improvements on aged and worn-out facilities to ensure a stable energy supply. Particularly, the Changwon II plant installed a 154KV transformer, a circuit breaker, and an emergency power supply back-up system to prepare for the blackout caused by cable malfunction. Please refer to page 44 for more information on energy conservation activities.

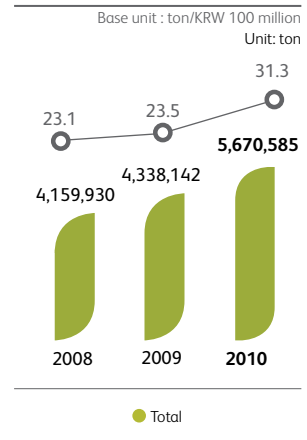
**Environment** • LGE is giving its best effort to improve the manufacturing process and managing the source of pollution by minimizing emission of environmental pollution that is created during the manufacturing process. Production sites in Korea, excepting Cheongju and Gumi, are composed of mostly simple assembly process which generate less environmental pollutants compared to other manufacturing industries. However, LGE is continuously making efforts to seek out

best practice to strictly manage environmental impact. At the Pyeongtaek site, the LCD module packages were previously incinerated, but they are now cleaned and reused. This was achieved through continuous cooperation with partners and resulted in saving incineration and package costs by over 3.6 billion KRW annually (based on monthly production of 30,000 units). At the Cheongju site, the amount of daily wastewater from the membrane production process was reduced from 10 tons to 5 tons, by filtering it once again before discharge. The generated waste and wastewater increased dramatically in 2010 compared to 2009 because of increasing sludge from changed manufacturing process in Gumi PDP site, waste from closed video tape plant in Cheongju site, and waste and mass production initiated from solar plant in Gumi site. Please refer to pages 80 to 82 for environmental data at other sites in Korea and overseas. In addition, LGE's employees are continuously participating in environmental protection activities. In particular, employees are involved in various volunteer activities and participate in events on special days for the environment such as the Water day, Arbor day, Children's day, Ocean day, World Environment day, and Recycling day, to contribute towards environmental protection for the local community.

**Generated and Recycled waste(in Korea)**



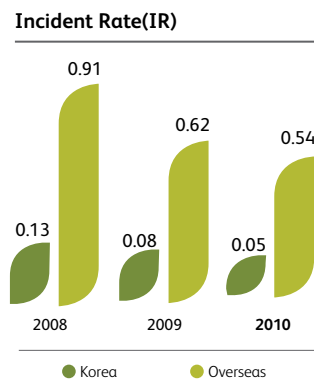
**Water usage(in Korea)**



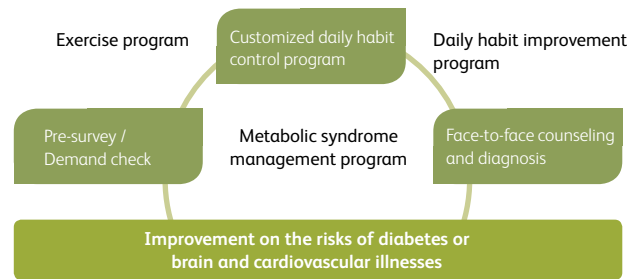


**Safety** • LGE is making an effort to identify potential accidents and share corrective measures by holding BP presentation events. The number of accidents occurring at the Changwon site is decreasing due to the identification of possible causes of accidents and shared BP cases. In addition, LGE’s Labor Union and Honorary Industrial Safety Inspector conducts cooperative investigation of the worksites to ensure a safe, working environment, and compliance with safety and health guidelines. Together with these efforts, LGE has established an accident prevention plan for every seasons and has been implementing various activities to improve awareness of safety and health among employees. In response to the increasing number of traffic due to increase of logistics and new employees at the Pyeongtaek site, LGE installed a Digital DFS(Driver Feedback Sign) system, an audible speed warning system, to prevent traffic accidents. In addition, LGE has been managing the Incident Rate(IR) index since 2008. The IR index is calculated by dividing the number of injury and illness cases with days away from work by the total working hours. Thus, lower value signifies a lower accident rate. Since its first calculation in 2008, the IR index has continuously declined.

**Fire prevention** • LGE has adopted history card and management manual systems for fire prevention facilities to manage facilities in an optimal way. LGE also issues a Non-Conformance Report card to ensure the proper operation of the Standard Operating Procedure(SOP) monitoring system. All employees are trained on the usage of the fire extinguisher which is specially designed for training. In addition, employees at the Fire Prevention Center are dispatched to 119 Emergency Rescue Centers for training on fire extinguishing, emergency rescues and evacuation activities. Moreover, headquarters conducts unannounced drills so that employees can be always prepared for accidents and be aware of response measures. Every worksite has established a cooperative relationship with the local fire department for the safety of local community. For example, the Gumi site has provided direct support such as dispatch of fire engines for five times in 2010. In addition, LGE also conducts regular training to prepare against leakage of hazardous substances at each worksite. Through such activities, LGE is enhancing employees’ awareness on characteristics of hazardous substances and training them for urgent cases.



**Metabolic syndrome management program**



**Health** • LGE has been implementing a Total Health Program(THP) to improve the health of employees. LGE is continuously promoting quit smoking and overweight management programs in all of its business sites while relieving the employees’ stress through psychiatric counseling service. Such efforts allow employees to better focus on their work. In addition, LGE is making an effort to reduce noise and improve the ventilation system for a better working environment. In case of the Changwon I plant, a tornado ventilation hood was installed to reduce welding fume, which significantly improved the working environment. Pyeongtaek site has jointly developed a web-based daily habit control program(for both on and off-line) in cooperation with a university to assist employees with a metabolic syndrome. The program includes 16 weeks of concentrated control and 2 months of post-activities. Employees learned how to self-manage their daily habits and reduced the risk of metabolic syndrome by 16%. Furthermore, every business site reduced the number of smoking rooms or isolated smoking area to prevent non-smokers from second-hand smoking, along with implementing quit smoking programs for smokers. Particularly, Changwon is soon to be declared a smoke-free site in 2011.

**FUTURE DIRECTION**

• **LGE is making efforts to stabilize the integration of the EESH management system, and apply global standards to improve the KPI throughout all areas of EESH.**

1. Development of global EESH audit checklist and training program for auditors
2. Promotion of a leading green company by minimization of pollution and continuous environmental protection activities
3. Adopting Behavior-Based Safety(BBS) concept for developing accident prevention program
4. Reduction of potential fire risks by developing fire risk evaluation index
5. Management of occupational health with the cerebro/cardiovascular illness risk index and Total Health Program(THP)