

# HPC, OUR LIFE, OUR FUTURE

HPC Sustainability Report 2010

HPC SUSTAINABILITY REPORT 2010



 **HONAM PETROCHEMICAL CORP**  
Lotte Tower, 395-67, Sindaebang-dong, Dongjakgu, Seoul, Korea

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# About this Report

This is the fourth report published by Honam Petrochemical Corp. describing its efforts and accomplishments for sustainability management. The 2010 Sustainability Report actively reflects stakeholders' opinion to take a step further towards a stakeholder-friendly company, and describes the joyful everyday life with HPC's products. We hope this report will act as the window of communication between the stakeholders and HPC which strives to advance together with the stakeholders.

## ISSUES OF INTEREST BY STAKEHOLDER GROUP

	Employees	Community	Academia	Partner companies	Within industry
<b>Economic</b>					
Expansion of production capacity	●			●	
Identifying and initiating new business	●		●	●	●
Expansion of facilities investment	●			●	
Business management innovation		●			
Enhancing brand power	●	●			●
Building foundation for global business	●		●	●	●
Management standardization including international accounting standards			●		●
R&D investment / new technology development	●	●	●	●	
Compensation distribution	●				●
<b>Social</b>					
Providing product information				●	●
Mutual growth with partner companies (technological support, financial support)	●	●	●	●	●
Fair trade with partner companies				●	●
Human resources development	●		●		
Fostering communication within the organization	●		●		●
Environment and health management	●	●		●	●
Welfare	●				
Social contribution	●	●	●	●	●
Risk management					●
Labor-management relations	●				
<b>Environmental</b>					
Improving the green management system	●	●	●	●	●
Development of eco-friendly products	●	●		●	●
Response strategy against climate change	●	●	●		
Reducing greenhouse gases	●		●		
Responding to environmental regulations on products	●		●		●
Energy conservation	●			●	

## REPORTING PERIOD AND SCOPE

HPC has been publishing the Sustainability Report since 2007, and this report corresponds to the period between January 1st to December 31st, 2010. Some sections include data during the past two years to help stakeholders better understand the trend, and information from the previous "Sustainability Report 2009" and activities during the first half of 2011 have been included where necessary. The organizational structure and governance section reflects the decisions made at the general shareholders meeting held in March 2011.

The scope of the report covers business sites within the country including the Seoul main office, Daejeon research institute, Yeosu plant and Daesin plant, except for some qualitative activities which include subsidiaries and overseas branches.

## REPORTING FRAMEWORK

This report follows the GRI (Global Report Initiative) G3.1 guideline and reflects the ISO 26000 social responsibility international standard. Details of how the standards have been reflected can be found at the Index section. This report was prepared according to the IFRS, and the standard unit for environmental indexes are mentioned for each index.

## ASSURANCE OF THE REPORT

The general contents have been verified by the task force team composed of staff in charge of preparing this report and underwent third party assurance by the Korean Foundation for Quality to further enhance the reliability of the information contained in the report.

## FURTHER INFORMATION AND FEEDBACK

Further details are available at HPC's website, and the Korean or English version of the report can be downloaded in PDF. You can access HPC's website more conveniently through the QR code at the back page of the report. To provide feedback on the report please fill out the survey at the back of the report or contact us at the address below.

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Honam Petrochemical Corporation will become Asia's leading petrochemical company as a reliable neighbor that strives for mutual growth with the stakeholders, pursuing sound growth through low-carbon green management that cares for Earth.

## **CEO Message**

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## Dear Stakeholders!

Despite difficult domestic and global economic circumstances Honam Petrochemical Corporation accomplished KRW 7 trillion in sales for the first time in 2010. It increased its production capacity through new plant expansions and secured visible accomplishment in overseas business through acquiring Titan Chemicals of Malaysia. At the end of 1979 when HPC first started commercial production, it had 3 affiliated plants with an annual capacity of only 230,000 tons. Now, it has grown as the petrochemical company leading the Korean market with a capacity of 14 million tons including its subsidiaries. We also made major accomplishments towards our goal in functional materials by acquiring DACC, signing a contract for cooperative project in composite resins in Hefei, and entering the PET film business. We believe this is the result of the capacity we have accumulated thanks to the interest and support of our stakeholders.

Tapping into the 30 years of experience, it is now time to prepare for the next leap forward as Asia's top chemical company. As a start, I have mentioned that 2011 will be a year of enhancing inner strength that will balance the outward growth we have accomplished so far. I believe now is a time that calls for even closer ties with the stakeholders. HPC has been considering and acting upon its duties and role as the industry leader, a member of society, and a good place to work at for the employees.

HPC puts its efforts into breathing new life into the petrochemical industry by developing new growth engines and spreading it throughout the industry. From the nano-propylene composites that has reached commercialization stage to the carbon composites and large-scale energy storage batteries, HPC is focusing its R&D capacity in eco-friendly materials for green growth and substitute businesses, while providing full support for partner companies' sustainability management through technical and financial support for the ultimate goal of mutual growth.

As a member of the community, HPC also strives to be the best partner for the employees in enhancing their capabilities, as well as a company that fulfills its social responsibilities. HPC will build a corporate culture where employees can work in a safe and pleasant environment, and a family-friendly company that cares for the employees' families, and spread its corporate culture of sharing to the local community.

Lastly, as a global citizen HPC will actively respond to the climate change issue and spearhead the movement to minimize environmental impact. HPC's response strategy toward climate change is recognized as one of the leaders among Korean companies as it was selected as the leading company in CDP Korea (Carbon Disclosure Project). However, unwilling to be satisfied at this, we developed GEMS in 2010, an integrated green management monitoring system, taking green management one step higher.

As recognition for its efforts, HPC was selected as the best company in the petrochemicals industry at the DJSI Korea for two consecutive years since 2009. HPC takes this to be the encouragement from its stakeholders to implement stronger measures for sustainability management, and will strive to become a close neighbor and reliable leader.

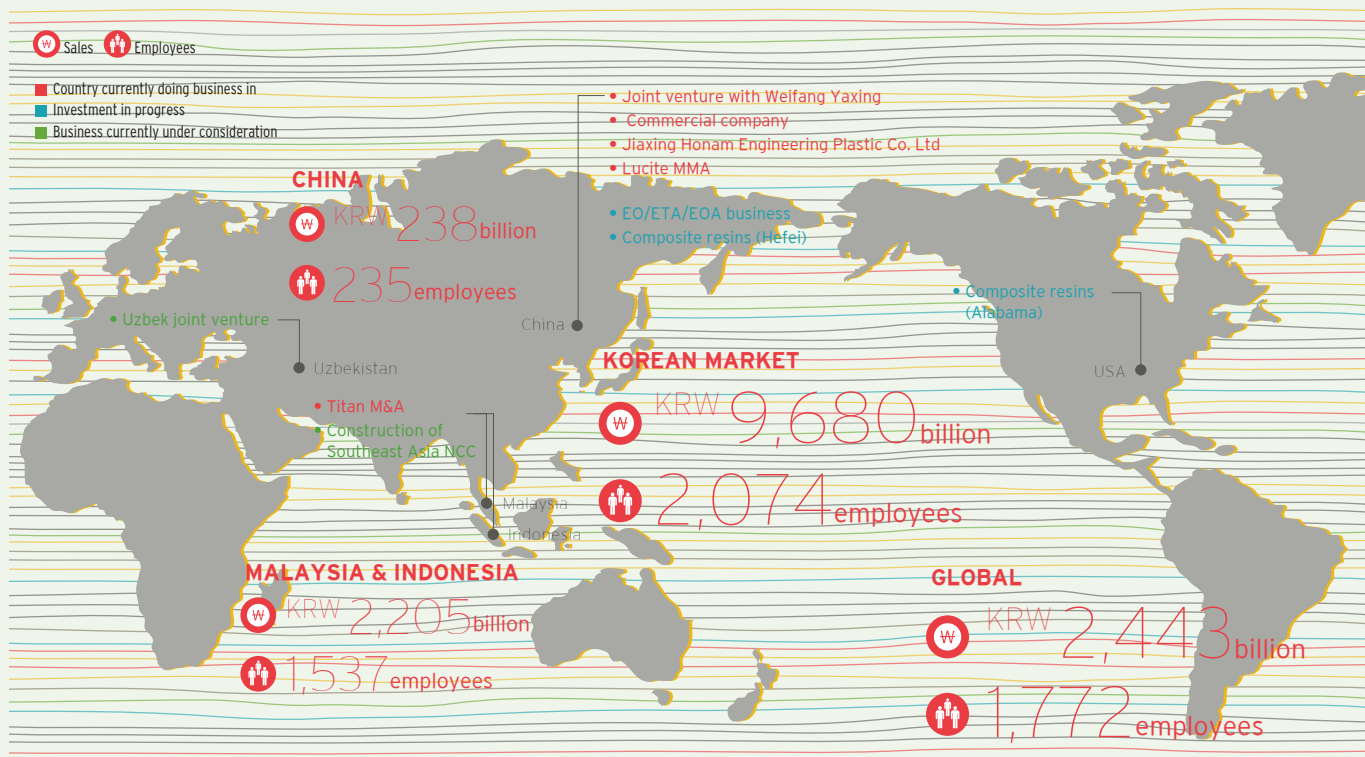
We hope for your continued support and encouragement this year as well, and wish you happiness and health.

President & CEO **Chong, Bum Shick**

Handwritten signature of B. S. Chong in black ink.

# Global Network

HPC is a global chemicals company with an annual capacity of 14 million tons including its subsidiaries. With a view to becoming Asia's top chemicals company HPC enhanced its global competitiveness, enhancing its production capacities by acquiring Titan Chemicals of Malaysia in 2010, and securing the basis for new growth by acquiring DACC Custom Composites.



Approx. **3,800** employees  
are working at HPC.

Total of **19** companies  
9 domestic, 10 overseas subsidiaries

**14** million tons  
14 million tons of petrochemical products are produced annually.

Business sites within Korea		
<b>Head office:</b> 395-67 Lotte Gwanak Tower, Sindaebang 2-dong, Dongjak-gu, Seoul		<b>354</b> employees
<b>Yeosu Plant:</b> 172 Jungheung-dong, Yeosu-si, Jeollanam-do 750,000 tons of ethylene/year, as well as PE, PP	KRW 3,237 billion	<b>648</b> employees
<b>Daesan Plant:</b> 634 Dokgot-ri, Daesan-eup, Seosan-si, Chungcheongnam-do 1 million tons of ethylene/year, as well as PE, PP	KRW 3,952 billion	<b>454</b> employees
<b>Daeduk Research Institute:</b> 24-1 Jang-dong, Yuseong-gu, Daejeon Development of synthetic resins and advanced materials		<b>136</b> employees
Subsidiaries (domestic)		
<b>KP Chemical:</b> Nam-gu, Ulsan Petrochemical products business	KRW 2,425 billion	<b>609</b> employees
<b>Howtech:</b> Yesan-gun, Chungcheongnam-do Expanded polypropylene	KRW 3 billion	<b>19</b> employees
<b>Sambark LFT:</b> Asan-si, Chungcheongnam-do Manufacture and sales of LFT	KRW 23 billion	<b>45</b> employees
<b>Sambark:</b> Asan-si, Chungcheongnam-do LFT applied products	KRW 35 billion	<b>41</b> employees

**DACC:** Wanju-gun, Jeollabuk-do  
Carbon composites business  
KRW 6 billion **122** employees

Subsidiaries (overseas)		
CHINA		
<b>Honam Chemical Trading (Shanghai) Corp.:</b> Shanghai, China Sales of petrochemical products	KRW 200 billion	<b>53</b> employees
<b>Jiaxing Honam Engineering Plastics Co., Ltd.:</b> Jiaxing, China PP compounding production	KRW 38 billion	<b>125</b> employees
<b>Jiayang Sanjiang Honam Chemical Co., Ltd.:</b> Jiayang, China EO derivatives		<b>12</b> employees
<b>Honam Chemical (Jiayang) Co., Ltd.:</b> Jiayang, China ETA, mPEG		<b>45</b> employees

\*Sanjiang Chemical (HPC holds 50% shares) and Honam Chemical(Jiayang) are currently constructing the production plants

ASIA		
<b>Titan Chemicals Corp.:</b> Johor Bahru Malaysia Petrochemical products	KRW 2,205 billion	<b>1537</b> employees

■ Sales ■ Employees



# 2010 Highlights

## Largest operating profits

KRW 780 billion

Despite domestic and global unfavorable conditions, HPC accomplished vertical integration through continued M&A and plant expansion, and recorded sales of more than KRW 7 trillion for the first time in its history through business diversification such as new materials development, receiving the "3 Billion Dollar Export Award" on Trade Day.

## Acquisition of Titan, Malaysia's largest chemical company

KRW 1,500 billion

In July 2010, HPC acquired Malaysia's largest chemical company Titan Chemicals Corp at KRW 1,500 billion. With Titan's acquisition HPC not only secured the economy of scale in the Southeast Asian region which is a logistics hub of the world, but also expects synergy in raw materials purchase and sales through regional product integration.

## 2012 Ethylene production capacity

2.72 million tons

HPC will invest KRW 520 billion from 2010 to 2012 in the Yeosu Plant to expand the NCC (Naphtha Cracking Center), PE (polyethylene) and PP (polypropylene) production facilities. Through the expansion of the NCC, the annual ethylene production capacity will increase from 750 thousand tons to 1 million tons, and adding the existing 1 million ton capacity of the Daesan plant and 720 thousand tons from Titan, HPC will be able to secure an annual production capacity of 2.72 million tons of ethylene.

## Ethylene production volume for 2 consecutive years

1 million tons

Daesan plant which has the largest ethylene production capacity in Korea of 1 million tons, produced 1 million tons for the last 2 consecutive years. Manufacturing 1 million tons of ethylene for 2 straight years is a first in the world. Moreover, the ethylene production process in the Yeosu plant reached 2,000 days of continued operations, which is proof of HPC's high productivity based on safety.

## Strengthening functional materials business

PM performance materials

In August 2010, HPC acquired DACC Custom Composites, which specializes in carbon-carbon composites. Carbon fiber is the performance material of the next generation which boast high tensile strength and elasticity 4 times greater than that of steel and is 50% lighter than aluminum. HPC already acquired Howtech, a manufacturer of eco-friendly expanded PP and Sambark LFT which produces long-fiber thermoplastics, strengthening its position in the high performance materials field together with DACC.

## Built integrated green management system

GEMS

In December 2010, HPC built GEMS, an SAP-based integrated green management system for the first time in the petrochemicals industry. GEMS analyses and manages environmental performance, financial performance and performance evaluation on a real-time basis. Analysis results are utilized in deciding external response measures and internal management, providing base data for accumulating HPC's sustainability capabilities based on green management.

## Mutual growth fund

KRW 36 billion

HPC raised a mutual growth fund of KRW 25 billion to help SMEs' financial difficulties and abides by the principle of 100% cash payment within 10 days. In addition, HPC is actively participating in win-win projects for SMEs in the petrochemicals & plastics sector, pledging to contribute KRW 36 billion to the SMEs mutual growth project that aims to raise KRW 148.1 billion.

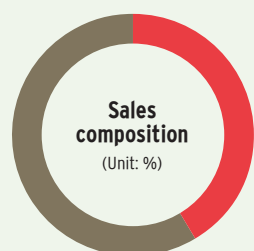
## Selected as best company in DJSI Korea

DJSI Korea

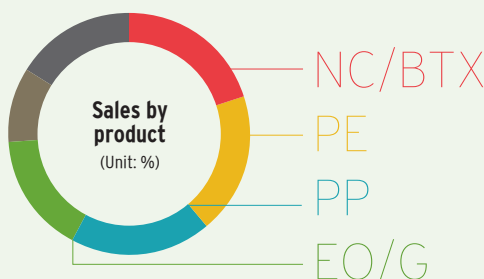
HPC was nominated as the best company in the chemicals sector by DJSI Korea for two consecutive years, which evaluates and selects companies based not only on the financial performance but also on their environmental and social performances. As a member of the community, HPC will strive to become a sustainable enterprise that practices social responsibility in its management activities, always putting environmental and social impacts first in doing business.

# Financial Highlights

In 2010, HPC achieved sales volume of over KRW 7 trillion, and received the "3 Billion Dollar Export Award" on Trade Day. In addition, through its acquisition of Titan, a Malaysian chemical company and continued plant expansion, HPC achieved vertical integration from raw materials to products, and is take big steps toward advancing as Asia's leading chemical company by 2018 by new materials development and business diversification.



**71,891**  
in total sales (unit: KRW 1 billion)

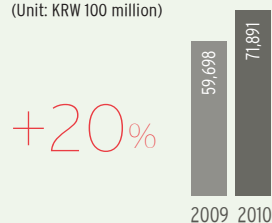


- NC/BTX ..... 20%
- PE ..... 19%
- PP ..... 19%
- EO/G ..... 16%
- SM ..... 10%
- ETC ..... 16%

The order of sales amount by product is: NC/BTX, PE, PP, EO/G, and SM

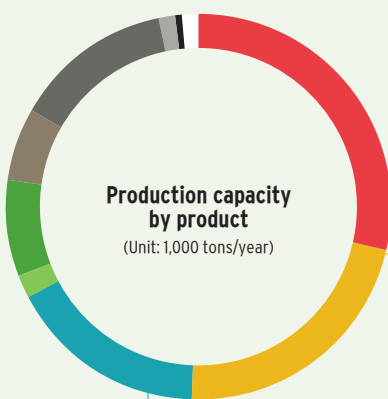
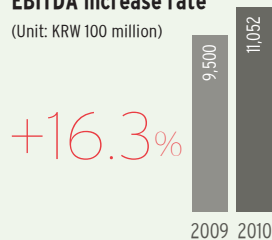
## HPC's sales growth rate in 2010

(Unit: KRW 100 million)



## EBITDA increase rate

(Unit: KRW 100 million)



- PE ..... 1,795
- PP ..... 1,360
- MEG ..... 1,040
- EOA ..... 130
- SM ..... 500
- BD ..... 380
- BTX ..... 830
- PC ..... 80
- MMA ..... 50
- PET ..... 70

6<sup>th</sup>  
in global ranking

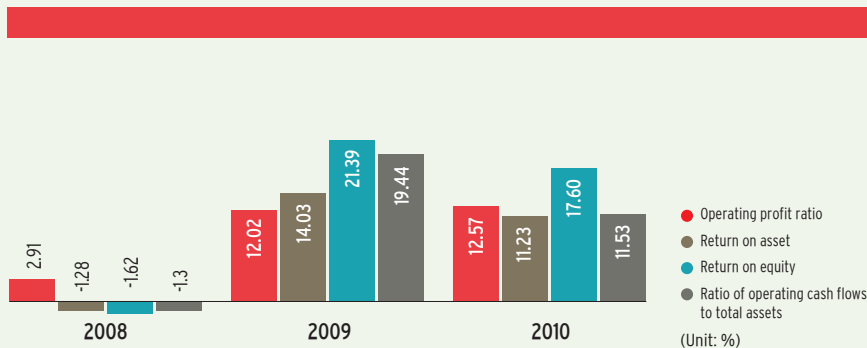
Through its operations of the Yeosu and Daesan plants and Titan in Malaysia, HPC's annual production capacity of ethylene is 2.47 million tons, PE 1.795 million tons, PP 1.36 million tons, EG 1.04 million tons, SM 500,000 tons, and maintains first place in the Korean market for HDPE, PP, and MEG.

## HPC's condensed income statement for 2010

(Unit: KRW 100 million)

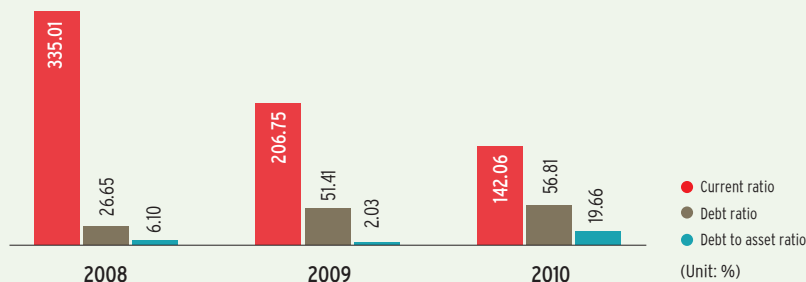
SALES	OPERATING INCOME	ORDINARY PROFITS	NET PROFIT	EBITDA
71,891	9,039	10,178	7,843	11,052





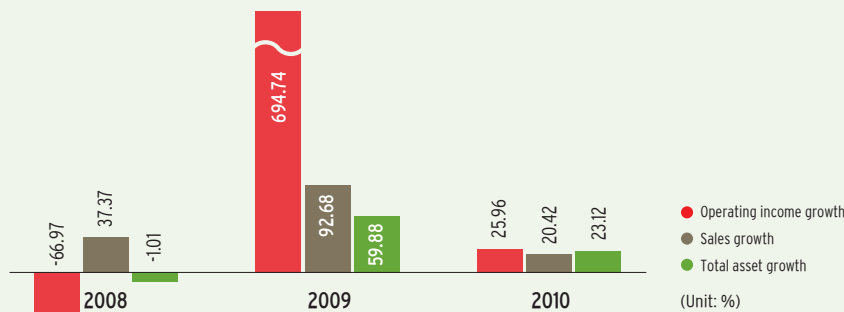
### Profitability Index

With solid increase in demands from China and emerging countries HPC recorded highest operating profits and EBITDA, and earnings before taxes exceeded KRW 1 trillion for the first time. Overall, product prices were strong, and the synthetic fiber is showing higher prices than expected. As the price of naphtha heavily affects the price of petrochemicals, HPC focuses on maintaining moderate profitability and stable sales rather than exponential increase in profitability.



### Stability Index

Following the merger with Lotte Daesan Petrochemical Corporation in 2009 and despite the acquisition of Titan, Malaysia's largest chemical company at KRW 1.5 trillion in 2010, HPC maintains a debt ratio of about 50%, showing high financial stability.



### Growth Index

HPC's sales in 2010 increased by 20.4% compared to the previous year, and the K-IFRS consolidated sales was KRW 12.4 trillion. This rapid growth was the result of expanding the domestic market and actively entering overseas markets by enhancing the competitiveness of major products, business specialization through new materials development, increased production through facilities investment and cost reduction. External factors include recovered demand thanks to the measures to stimulate the economy by foreign governments, competitors' adjustment of operation rate and delayed operations of new production plants, which brought forth more favorable supply conditions than was expected.

9 times

#### 2010 Board of Directors

In 2010, the meeting of the Board of Directors was held 9 times, with a target of operating the BOD at least once a month.

0 cases

#### Number of labor-management disputes in 2010

In 2010, HPC won the grand prize for labor-management cooperation in the large companies sector at the Korea Labor-Management Cooperation Awards designated by the Ministry of Employment and Labor.

0%

#### Accident rate

HPC achieved zero-accidents for 4 consecutive years, as well as zero injuries and occupational disease for 5 years.

2000 days

#### Non-stop operation of the ethylene plant

Yeosu NCC plant achieved 2,000 days of non-stop operations for the past 5 and a half years, recording the longest period of non-stop ethylene plant operation in Korea.

# Stakeholder Engagement

**Definition of stakeholders** We believe HPC's true value is created through communication with the stakeholders and is completed through stakeholders' satisfaction. HPC categorizes individuals or organizations that influence management activities into 6 groups according to their scope of activities, contact frequency and importance. HPC maintains communication channels for each stakeholder group and strives to secure its position as a sustainable company, and a respected company. As HPC is advancing towards being a global enterprise, we will prepare more diverse stakeholder communication channels and improve the opinion collecting process, strengthening the foundation for sustainability management.



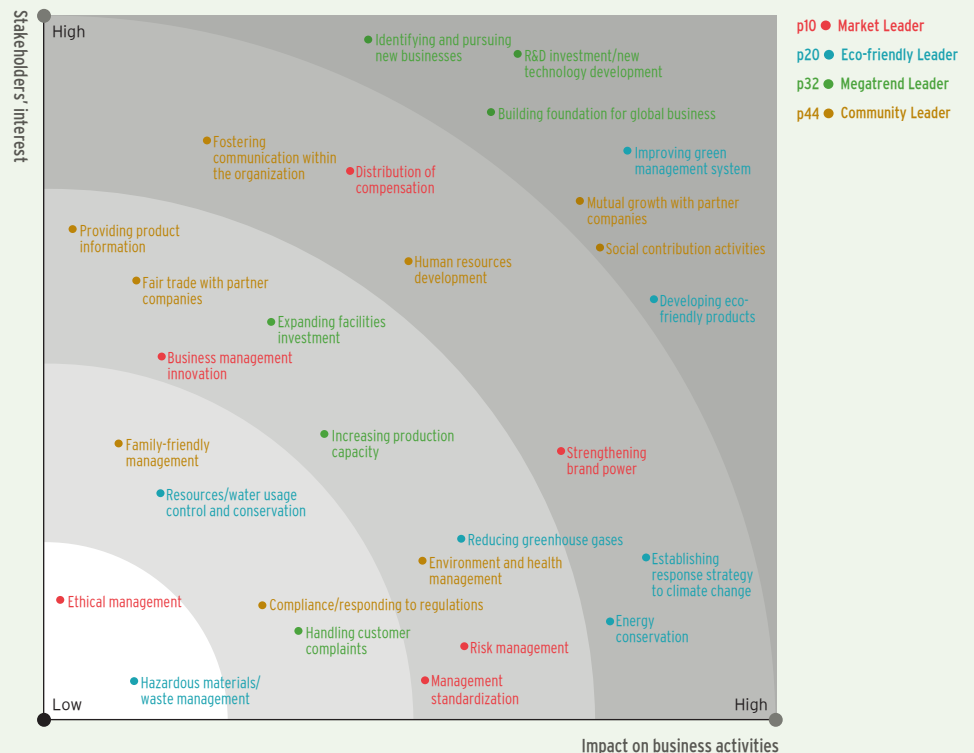
**Stakeholders' perception of HPC's sustainability management** At the independent survey conducted in May 2011 on internal and external stakeholders on their perception of HPC's sustainability management, stakeholders generally gave high points to HPC. Internal stakeholders gave high points for ethical management, and external stakeholders gave high points for building a good workplace and contributing to the local economy, and it was shown that the stakeholders commonly expect a relatively more active involvement in social contribution. HPC is thus building response measures for a more systematic social contribution activities, and is putting its efforts in improving the sustainability management structure by reflecting stakeholders' opinions in its sustainability management strategy.

Internal stakeholders						External stakeholders				
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
0%	1%	9%	47%	42%	HPC pioneers transparent and ethical management.	0%	0%	15%	36%	49%
1%	1%	20%	58%	20%	HPC identifies various stakeholders and strives to enhance relationships with them.	0%	2%	15%	43%	40%
0%	6%	21%	46%	27%	HPC strives to build a good workplace, and a fair corporate culture.	0%	2%	11%	43%	45%
1%	2%	26%	48%	22%	HPC's business and activities contribute to the local economy.	0%	2%	11%	41%	46%
0%	1%	21%	49%	28%	HPC is conducting various activities for low-carbon, green growth.	0%	2%	27%	40%	31%
1%	9%	26%	45%	19%	HPC puts efforts to contribute to the local community.	0%	2%	27%	40%	31%
0%	7%	18%	51%	25%	HPC fulfills its social responsibilities through various methods.	0%	0%	30%	33%	37%
0%	1%	13%	60%	26%	HPC is minimizing its environmental impact through green management.	0%	2%	17%	54%	26%

# Materiality Test Process

It is very important to understand stakeholders' area of interest and their effect on the company's business activities when preparing a sustainability report. HPC built an independent materiality test process and prepares the report focusing on issues that stakeholder are commonly interested in and that have high potential impact in HPC's operations. In the materiality test, issues related to the economy and management scored highest, and it was shown that stakeholders hold green management system and eco-friendly products to be important as well. Thus, the Sustainability Report 2010 was divided into Market Leader, Eco-Friendly Leader, Megatrend Leader and Community Leader, in accordance with the priority identified through the materiality test. In addition, HPC's products used in daily life are introduced at the start of each section to help stakeholders' understanding and emphasize HPC as a friendly neighbor.

Major Issues in 2010	
1.	Identifying and pursuing new businesses
2.	R&D investment/new technology development
3.	Building foundation for global business
4.	Improving green management system
5.	Mutual growth with partner companies
6.	Social contribution activities
7.	Developing eco-friendly products
8.	Fostering communication within the organization
9.	Strengthening brand power
10.	Energy conservation
11.	Human resources development
12.	Increasing production capacity



## Materiality Test Process

STAGE 1	STAGE 2	STAGE 3	STAGE 4
<b>Identifying issues</b>	<b>Analyzing company's policy</b>	<b>Deciding priority</b>	<b>Review</b>
<p>An issue pool of 158 issues was formed by analyzing the recent sustainability management trend and HPC's sustainability management issues.</p> <ul style="list-style-type: none"> <li><b>Media analysis:</b> Domestic daily newspapers, broadcasts, communications and local magazines between Jan. 1, 2010 to Dec. 31, 2010 were analyzed and categorized under economic, social and environmental issues</li> <li><b>Stakeholder survey:</b> Issues of concern were identified through surveys on employees, local community, chemical industry, partner companies and academic circles.</li> </ul>	<p>HPC's management policy and implementation measures to advance as Asia's top chemical company and achieve KRW 40 trillion in sales by 2018 were analyzed to understand their impact on business operations and identify key issues.</p>	<p>The materiality test was conducted on the issue pool in order to select issues that stakeholders are highly interested in and have high potential impact on HPC's business operations. Materiality was evaluated based on stakeholders' degree of concern and impacts caused by decision-making and business operations, and 27 material issues were identified through this process.</p>	<p>After the selected issues were reviewed within the TF team, they were reported to management level and acquired their approval, then were finally fixed as issues to be included in the report.</p>

# We will become Asia's top chemical company by cultivating new growth engines and achieving our vision

## Market Leader

We have followed one path with unchanging assiduousness rather than trying to step ahead of others. Since 1976 when the domestic petrochemical industry was close to null until the present day in 2011, and until 2018 when we become Asia's top chemical company with sales of KRW 40 trillion, our stance has not and will not waver. As a market leader of the petrochemical industry, HPC pursues strengthening of core capabilities, management by wandering around, human resources cultivation and brand management, and practices sustainability management that values open communication with the stakeholders on management-related matters in general.

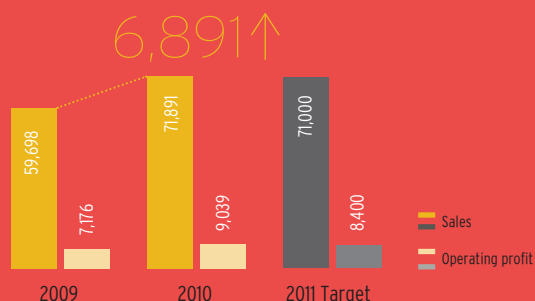
## Priority Issues

Enhancement of brand power, sustainability management, ethical management

### Economic performance

(Unit: KRW 100 million)

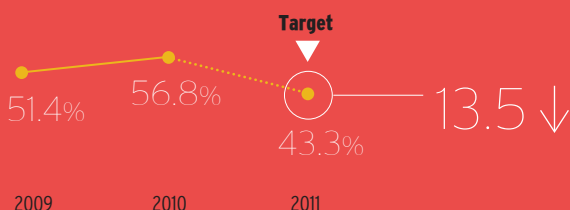
In 2010, HPC achieved the greatest sales volume in its history at KRW 7,189.1 billion.



### Debt Ratio

(Unit: KRW 100 million)

HPC will lower its debt ratio by 13.5% in 2011.



### 2010 SUSTAINABILITY MANAGEMENT PERFORMANCE

HPC was recognized as an enterprise that values social responsibility and practices sustainability management

Included in the 2010 DJSI Korea for the 2nd consecutive year, and entered SRI

In recognition of internalizing sustainability management and its pioneering social responsibility activities as a corporate citizen, HPC was newly selected in the Socially Responsible Investment (SRI) index designated by Korea Exchange, and was nominated best chemical company for 2 consecutive years by DJSI Korea. In order to further internalize sustainability management befitting its reputation, HPC conducted an independent diagnosis of its sustainability management status according to the ISO self-diagnostic checklist and is adjusting its strategies and target to compliment areas that need improvement. HPC is mindful of the environmental and social impact caused by its business activities, and will put even more effort in becoming a sustainable corporation that fulfills its social responsibilities.

### INNOVATION MANAGEMENT PERFORMANCE IN 2010

Taking one step forward as a general petrochemical company through economy of scale and diversification of the business portfolio

Securing global competitiveness through steady expansion of the business scope

In 2010, HPC signed a contract acquiring Malaysia's largest chemical company Titan and completed total shares acquisition, achieving an economy of scale as well as securing its foothold in the Southeast Asian region. In addition, HPC successfully expanded its business scope in the functional materials business by acquiring DACC, signing a contract for cooperative project in composite resins in Hefei and entering the PET film business, reaching an important milestone in its path to realizing the vision to become Asia's top chemical company.





# Can you imagine a world without petrochemical products?

GHG REDUCTION AT NCC PLANT

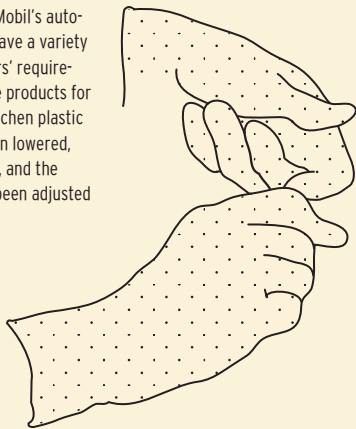
21,783 tCO<sub>2</sub>-eq



LDPE

**Low Density Polyethylene**  
(disposable plastic gloves)

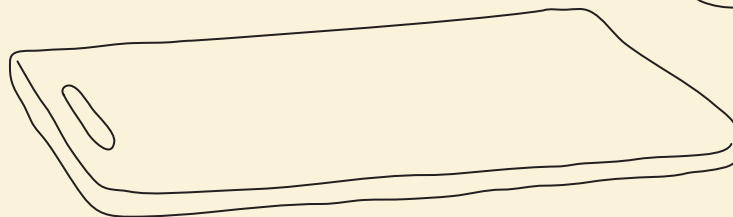
The LDPE is produced through Exxon Mobil's auto-clave technology and is designed to have a variety of features according to the customers' requirements. In particular, the density of the products for injection molding that are used for kitchen plastic gloves and container covers have been lowered, making them flexible and transparent, and the molecular size and distribution have been adjusted to minimize flow rate and distortion.



LLDPE

**Linear Low Density Polyethylene**  
(plastic wrap, cutting board)

LLDPE is produced at the gas phase polymerization process with optimized physical properties and machinability according to customers' requirements. In particular, HPC fully utilizes the process characteristics to produce products with high mechanical properties with no gel formation.



PP

**Polypropylene**  
(Lock & Lock)

Polypropylene is a thermoplastic with high rigidity, shock resistance, transparency and fluidity and is widely applied in products such as (transparent) food containers, packaging material, plastic parts for automobiles, and sanitary non woven. HPC owns production facilities that are largest in Korea and 6th largest in the world. In particular, in July 2008 the ZPP plant with Spherizone process began operation to produce differentiated PP products.

DOMESTIC RANKING GLOBAL RANKING

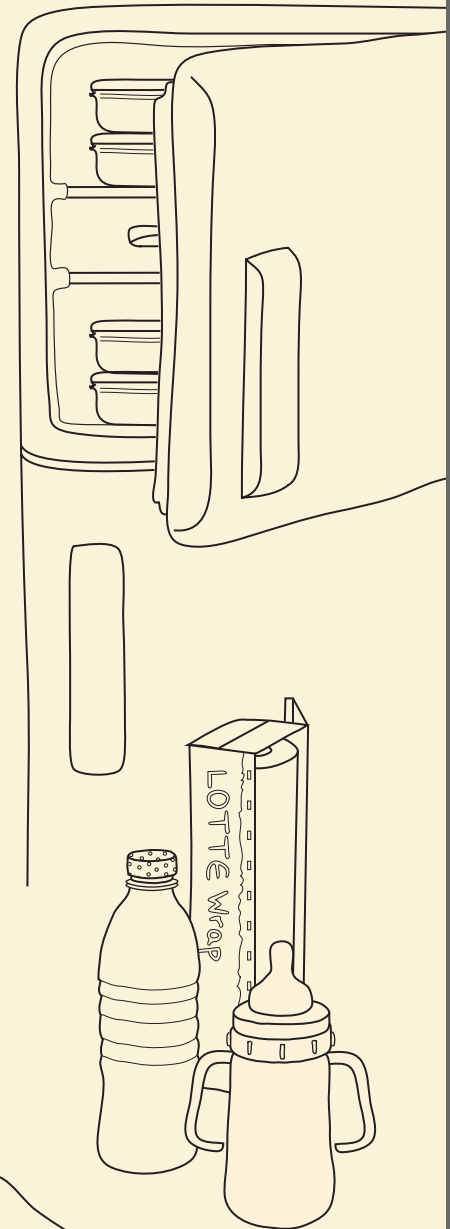
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HDPE

**High Density Polyethylene**  
(baby bottle, water bottle cap)

HDPE has high fluidity, shock resistance, electric insulation, moldability and cold resistance properties making it suitable for a wide ranging application such as baby bottles, various containers for the home, insulation cables, automobile fuel tanks, various pipes and films (agricultural, industrial, packaging). HPC developed its own HDPE polymerization catalyst and produces various pipes and automobile fuel tanks which are sold in both the domestic and overseas markets.



CO<sub>2</sub> Reduction

By implementing greenhouse gas reduction technology in 2010, the NCC (Naphtha Cracking Center) plant that produces the materials for LDPE, LLDPE, HDPE and PP products registered 21,783 tCO<sub>2</sub>-eq as early greenhouse gas reduction.

# Corporate Summary

## HONAM PETROCHEMICAL CORP.

**Company Name** Honam Petrochemical Corporation

**Founded** March 16, 1976

**Head Office** 395-67 Lotte Gwanak Tower,  
Sindaebang 2-dong, Dongjak-gu, Seoul

**Organization** Total 1,592 persons

**Finance** Sales KRW 7,189 billion  
Total assets KRW 6,987 billion

**Products** Basic Petrochemicals, Synthetic Resins,  
Basic chemicals

Since its foundation in 1976, HPC has focused on developing and localizing advanced petrochemical technologies and is the comprehensive petrochemical company that has pioneered the industry's advancement in the Korean market. Ever since it began commercial production in 1979 HPC has continued to expand its production facilities and business scope, and as of 2010, has grown into a global chemical company with a consolidated sales of KRW 12.4 trillion with business sites in twenty countries.

At the Yeosu and Daesan plants and Titan in Malaysia, HPC produces 2.47 million tons of ethylene, 1.80 million tons of PE, 1.35 million tons of PP, 1.04 million tons of MEG, and 500 thousand tons of SM annually, and it occupies the largest domestic market share for HDPE, PP and MEG.

With the goal of becoming "Asia's top chemical company with sales of KRW 40 trillion by 2018," HPC is further strengthening the existing petrochemicals business and putting efforts in the high value-added new businesses such as the industrial light material, building a more stable business portfolio and securing its foothold as a sustainable enterprise. In addition, with the production and sales branches in China, HPC plans to grow as a leader in the global chemical industry through active market expansion to regions including Malaysia and Southeast Asia, Uzbekistan and the United States. HPC strives to be a company that grows steadily and makes sound profits even in rapidly changing market conditions, while fulfilling its social responsibility and contributing to human society.

### HPC's organizational structure



### HISTORY

#### Early Period - Downstream expansion

<b>1976</b>	Honam Petrochemical Corporation was founded
<b>1979</b>	Began commercial production
<b>1988</b>	Completed construction of the second HDPE plant and second PP plant

#### Growth Period - Completion of integration and further expansion

<b>1991</b>	Listed on the stock exchange, completed construction of second MEG plant
<b>1992</b>	Completed the naphtha cracking center

#### Maturing Period - M&A, new plant expansion, overseas market

<b>2001</b>	Expansion of Yeosu plant
<b>2003</b>	Acquired Hyundai Petrochemical Corp. ( Lotte Daesan Petrochemical Corp.)
<b>2004</b>	Acquired KP Chemical
<b>2006</b>	Founded Daesan MMA Founded Honam Chemical Trading Corp. (China) Acquired Jiaxing Honam Engineering Plastics Co., Ltd. (China)
<b>2008</b>	Expanded Lotte Daesan Petrochemical Corp.
<b>2009</b>	Merger with Lotte Daesan Petrochemical (Daesan Plant) Acquired Sambark LFT and Sambark Co.
<b>2010</b>	Acquired Titan (Malaysia) and DACC

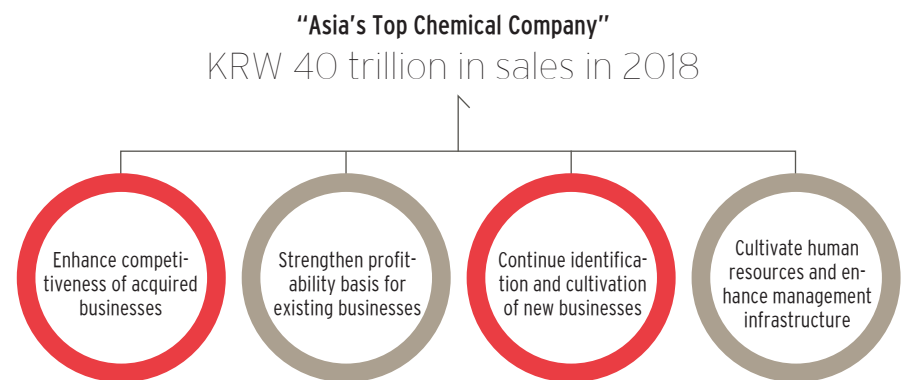


# Sustainability Management Strategy and Vision

## MANAGEMENT VISION

HPC aims to become “Asia’s top chemical company” by achieving KRW 40 trillion in sales by 2018. For this end, HPC will incorporate the M&A that is has been undertaking so far and further strengthen the profitability of existing businesses. In addition, HPC will continue to cultivate new businesses such as functional materials and megatrend business to secure global competitiveness. HPC will focus on cultivating employees who are at the core of sustainability management, and improve management infrastructure based on management innovation. HPC is always mindful of communication with the stakeholders in the process of enhancing its corporate culture, and strives not only for outward growth but also to advance as an admired company equipped with sustainable competitiveness.

## 2011 IMPLEMENTATION TASKS



## MANAGEMENT POLICY AND CORE VALUES

HPC’s management policy is the basic principle that encompasses economic, social and environmental aspects, and expresses the will to grow as an admired company with leadership. HPC’s core values - customer orientation, creativity, passion, cooperation and performance - are the standard values upon which HPC employees act and decide, and are the mindset practiced in everyday life and work. HPC is advancing as a sustainable corporation that grows with the stakeholders through various efforts and preparation to become Asia’s top chemical company.

## MANAGEMENT POLICY

<b>Enhance Core Capabilities</b>	Focus HPC’s capabilities on areas it excels at to secure competitiveness and expand it to related businesses
<b>Management by Wandering Around</b>	Always listen to the opinions of the field including customers, employees, partner companies and local community and reflect them in HPC’s strategies
<b>Cultivate Human Assets</b>	Recruit outstanding human assets and cultivate them into the best talents in the industry and global assets who will lead future growth
<b>Green Management</b>	Fulfill HPC’s responsibility for sustainable growth and the environment by supplying eco-friendly products through energy conservation and innovation
<b>Brand Management</b>	Ensure that HPC provides ultimate customer satisfaction and earn customers’ trust to take a leap as a global premium brand

# Sustainability Management Performance

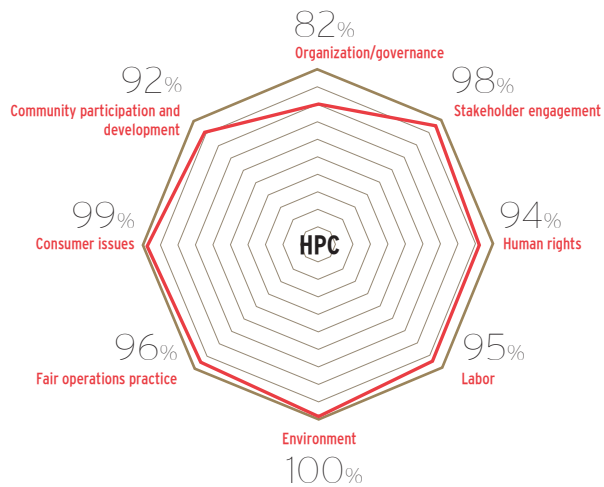
## ISO 26000

ISO 26000 is a guideline prepared by International Standard Organization on organizations' social responsibility which consists of 21 key elements: 7 principles of social responsibility, 7 core subjects and 7 implementation standards. ISO recommends organizations conduct self-assessment through the "ISO 26000 self-assessment checklist."

## ISO 26000 SELF-ASSESSMENT

As a means of intermediate inspection of its sustainability management activities HPC will disclose the self-assessment results conducted according to the ISO 26000 self-assessment checklist provided by KCCI BISO. The self-assessment was conducted on 8 core subjects - organization/governance, stakeholder engagement, human rights, labor, environment, fair operations practice, consumer issues and community participation and development. Among the core subjects, environment and consumer issues scored high points while organization/governance scored relatively low. HPC is adjusting its strategies and goals to improve those areas that need readjustment. HPC will conduct self-assessment annually to verify the current status of its sustainability management and establish improvement measures.

## ISO 26000 SELF-ASSESSMENT RESULTS



## ENTERED THE SOCIALLY RESPONSIBLE INVESTMENT INDEX

In 2010, HPC was newly selected in the SRI index designated by Korea Exchange, heightening its prestige as a sustainable company. The Stock Price Index Operating Committee evaluates and selects 70 outstanding companies based on their total market cap, trade volume and sustainability activities.

## INCLUDED IN THE DJSI FOR 2 CONSECUTIVE YEARS

HPC was named the best company in the chemical sector in the DJSI which selects companies who have shown outstanding performance not only in the financial aspect but also in the environmental and social aspects. As a member of the community, HPC will further strive to be a sustainable company that practices corporate social responsibility.



# Economic Performance

HPC recorded over KRW 7 trillion in sales through innovation activities and persistent efforts to enhance competitiveness, and maintains a stable net profit. Well aware that such achievements have meaning within the context of the relations with the stakeholders, HPC shares its economic accomplishments with the stakeholders and prepares for sustainable growth.

## CONDENSED INCOME STATEMENT

(Unit: KRW 100 million)

	2008	2009	2010
Sales	30,982	59,698	71,891
Operating profit	903	7,176	9,039
Income before income taxes	-714	8,533	10,178
Net profit	-453	7,967	7,843
EBITDA	1,638	9,500	11,052

## CONDENSED BALANCE SHEET

(Unit: KRW 100 million)

	2008	2009	2010
Total assets	35,510	56,774	69,866
Current assets	8,861	23,065	18,749
Non-current assets	26,649	33,709	51,117
Total liabilities	7,472	19,522	25,312
Current liabilities	2,645	11,156	13,198
Non-current liabilities	4,827	8,366	12,114
Total equities	28,038	37,252	44,554

## PERFORMANCE DISTRIBUTION

(Unit: KRW 100 million)

		2008	2009	2010
Customer	Product sales (domestic)	13,471	22,133	29,774
	Product sales (export)	17,511	37,565	42,117
Employees	Salary	625	1,155	1,224
	Pension and retirement allowance	80	134	142
Partner companies	Fringe Benefits	93	142	163
	Raw materials purchase	26,365	39,866	51,755
Shareholders	Service payment	21	138	166
	Total cash dividends	80	478	558
Local community	Interest	40	488	499
	Donations	21	28	43
Government	Corporate taxes	-262	566	2,335

\*Service payment is the total of the head office and production division

**Employees** > Represents the distribution of economic value including Salaries, various allowances, pension and severance payment, and welfare packages to the employees who are the central axis of HPC.

**Partner companies** > Partner companies are the customers and valuable partners, and HPC seeks for mutual growth with over 1,800 partner companies. The performance distributed to partner companies in 2010 total KRW 5,192.1 billion, due to increased raw material prices.

**Shareholders** > This item relates to the compensation distributed to the shareholders, investors and creditors and includes cash dividends and interests.

**Local community** > This item includes monies distributed through donations and sharing through activities such as human assets cultivation and social contribution.

**Government** > In 2009 the corporate tax expenses were lower than that of 2010 because of the carryover of deficit from 2008, and HPC paid the normal corporate tax amounting to KRW 233.5 billion in 2010.

# Ethical Management

## Ethical Management Roadmap

### 1 Phase (~2010)

#### MAINTAIN BASIC ACTIVITIES

- Send ethical management letters during holidays
- Relay CEO's directions for ethical management (holidays, end of the year, as needed)
- Write up and submit code of ethics self-pledge



### 2 Phase (~2012)

#### ESTABLISH SYSTEM AND CONDUCT TRAINING

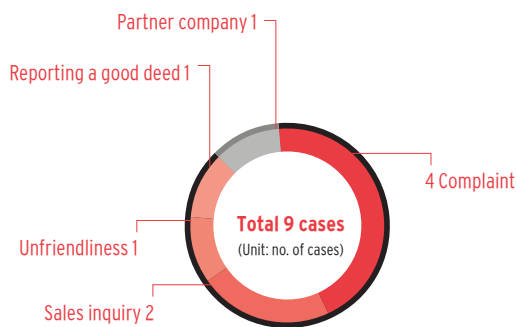
- Establish ethical management system
- Conduct training on the ethical management and the system
- Promotion campaigns for ethical management



### 3 Phase (~second half of 2012)

#### INTERNALIZE ETHICAL MANAGEMENT

- Fully active the ethical management system
- Implement ethical management reward program
- Implement ethical suggestions program



## Operation results of the complaints board

Internal Partner company

## ETHICAL MANAGEMENT IMPLEMENTATION STRUCTURE AND STATUS

HPC established a 3-phased ethical management implementation roadmap and practices ethical management by electing a Compliance Program supervisor, operating the Audit Committee, and the Management Consulting Team monitors the ethical management compliance status on a real-time basis. In 2009 all the employees participated in the ethical management self-pledge, and new recruits in 2010 were required to write up the pledge, further strengthening the dedication to practice ethical management.

HPC designates the holiday seasons such as Seol (lunar new year) and Chuseok (Thanksgiving) as ethical management enforcement period. During the Chuseok holidays in 2010, ethical management letters in the name of the CEO were sent to 865 partner companies, and 725 during the Seol holidays in 2011. After reviewing the replies received, there were no cases of non-compliance of ethical management found. In addition a survey was conducted on all employees and partner companies on their awareness on human rights, anti-corruption and transparent & ethical management, and cyber training was conducted on subjects such as sexual harassment prevention.

Human rights policy education was provided for a total of 81 information security personnel as well. In order listen to the valuable suggestions from employees, customers and partner companies HPC operates a complaints board at its homepage. Suggestions received through the board include complaints, improvement cases, non-compliance cases of ethical management, and commendations, which are immediately relayed to relevant departments so that quick action may be taken. In addition, the cases received are reflected in the training program to enhance fairness and transparency in HPC's operations.

## COMPLIANCE PROGRAM

HPC is implementing the CP (Compliance Program) to foster fair competition and prevent breach of fair trade law and unfair trade actions. Ever since the introduction of the CP in December 2006, regular training and inspection is conducted on sales personnel to heighten fair trade awareness, and spearheads affiliates in compliance with fair trade regulations as well. Currently the department overseeing CP is the legal team which reports operation results to the Board of Directors twice a year.

**CP operation details** > HPC elects a fair trade supervisor as the executive in charge of CP. The CP supervisor is nominated through the BOD and oversees the monitoring of compliance with fair trade regulations. In order to prevent losses and enhance competitiveness, HPC undergoes prior review by a fair trade expert before engaging in new businesses, sales or purchasing to prevent the potential for any breach of regulations and conducts internal inspection on major divisions. In addition, HPC published and distributed the fair trade handbook and provides training on revised laws to enable self-assessment of whether there are any breaches. In 2010 there were no cases of on-going investigation on non-compliance of fair trade regulation.

## CP PERFORMANCE IN 2010

**Fair trade training program for subsidiaries (3 times)** : Conducted fair trade training for new subsidiaries

The obligation for public postings of companies that are members of large group corporations, investment restrictions, debt guarantee / Announcement obligation under fair trade law / Obligation to report to the Fair Trade Commission on shares ownership

**Fair trade theory education - prior legal material support (3 times):**

Domestic and international restriction on cartels / Fair trade obligation of companies that are members of large group corporations / Obligations of companies who have newly joined the group as subsidiaries

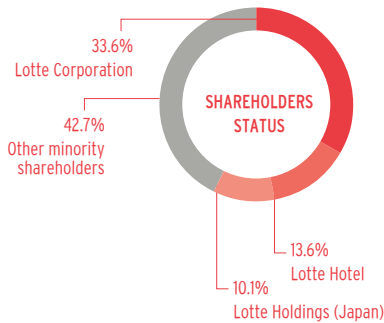
**Requirement for fair trade compliance pledge :**

Sales departments are required to submit a fair trade compliance pledge

**Review of fair trade issues:**

Supporting new subsidiaries in their renovation of fair trade supervising department / Distribution of public posting manual and training for subsidiaries / Checking other fair trade issues (31 times)

# Corporate Governance



## The Board of Directors

### Executive directors

Shin Dongbin: (Male) president, chairman

Chong Bum Shick: (Male) president, CEO

### Non-executive directors

Huh Soo Young (products): (Male) CEO of KP Chemical

Kim Hwayong (technology): (Male) professor at Seoul National University School of Chemical and Biological Engineering

Hwang Myeongcheon (finance): (Male) CPR advisor

Jeong Haewang (banking): (Male) former director general of the Bank of Korea Economic Research Institute

Jo Seungshik (legal): (Male) former senior prosecutor of the Supreme Prosecutor's Office

(As of March 11, 2011)

## SHAREHOLDERS AND CAPITAL STRUCTURE

HPC is an affiliate of the Lotte Group and the largest shareholder is Lotte Corporation which owns 33.6% of shares. Other affiliates include Lotte Hotel with 13.6% and Lotte Holdings (Japan) with 10.1%.

## INCREASING SHAREHOLDER VALUE

The total cash dividend in 2010 was KRW 55.8 billion won, and the dividend rate was 35% and paid KRW 1,750 per share. This dividend is based on the 2010 performance and also considers investments to secure business competitiveness and future growth. HPC will enhance competitiveness in core businesses and realize stable profits, maintaining dividend levels that will improve its financial structure as well satisfy shareholders' dividend demand to increase shareholder value.

HPC operates the "public posting control system" that reflects relevant laws and posting regulations of the Financial Services Commission and Korea Exchange, making accurate and quick postings on managerial matters to uphold the shareholders' right to know. HPC also operates a communication channel to listen to the voices of minority shareholders, who can exercise various minority shareholder rights such as viewing the company's book of accounts, demand extraordinary general shareholders meeting or the dismissal of directors.

## COMPOSITION AND OPERATION OF THE BOARD OF DIRECTORS

HPC's Board of Directors is composed of 7 directors and is the final decision-making body on the company's economic, social and environmental issues. Among the 7 directors 5 are independent non-executive directors. The CEO who is elected at the Board meeting is responsible for the overall company operations while being subject to the supervision of the Board of Directors and audit of the Audit Committee.

Regarding matters that require the Board's decision, employees can request the Board's approval after going through the labor-management council, and the Board makes decisions on major agendas regarding the company's fundamental management policy and operations according to relevant laws and the company bylaws. The remuneration limit for the executives including directors is set at the general shareholders meeting, and the amount and method of payment to each individual is entrusted to the CEO depending on the company's economic, social and environmental performance and individual performance. In 2010, KRW 1,641 million was executed out of the remuneration limit of KRW 3,000 million.

## BOARD OF DIRECTORS' ACTIVITIES

In 2010 the Board of Directors' meeting was held 9 times where 30 agendas including the nomination of the CEO and shares acquisition of Titan of Malaysia were discussed. In order to promote the Board's role of check and balance within the company, HPC regularly notices the non-executive directors on the company's current status and strives to encourage their expert advice.

## AUDIT COMMITTEE

HPC's Audit Committee not only conducts post factum audits on the operations of the Board of Directors but also devotes itself to blocking off corruption and conflict by focusing on preventive audits, fostering a bright and healthy organizational culture. The Audit Committee is comprised of 3 non-executive directors all of whom are nominated at the general shareholders' meeting and whose terms are in turn decided according to the company bylaws to ensure their independence. The Audit Committee convenes at least once every 3 months according to the rules of the committee.

# Risk Management Response System

## RISK MANAGEMENT SYSTEM

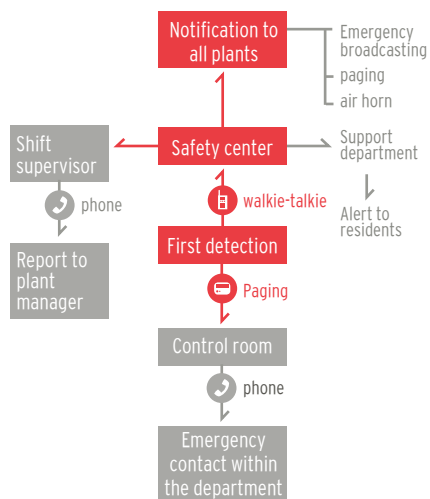
HPC operates a risk management communication system in order to respond to internal and external risks in a quick and systematic manner. The Crisis Management Team is comprised of risk management supervisors of each team including the CEO, the Management Planning Team, Legal Team, General Support Team and Production Team, as well as external experts. The CMT operates the Management Committee and Emergency Response Committee, assuring thorough control of managerial and environment/safety risks.

HPC's risk management supervisor is committed to enhancing employees' risk response capabilities by developing effective communication methods and internal training, and in case a crisis occurs HPC is able to respond quickly according to the crisis management communication procedure.

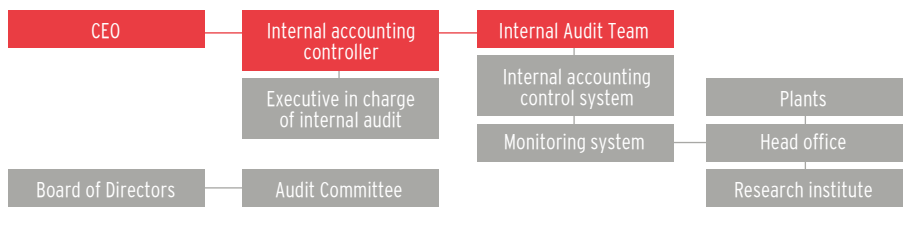
## CORPORATE RISK MANAGEMENT

HPC designated risk factors for each operation process including 7 items in purchasing such as exemption from compensation for arrearage and 8 items in sales such as early delivery; monitors them on a real-time basis and reflects those results when establishing mid-to-long-term strategies and business plans. In addition, internal audit is performed expeditiously on potential risks and strong post factum measures are taken to prevent the recurrence of similar risks. The Internal Audit Team conducted regular, nonscheduled and special audits during 2010, after which no case of corruption or discrimination was found, and internal control that prevents corruption is operating appropriately. The internal control is operated subject to the internal accounting rules and contributes to enhancing HPC's internal and external reliability, transparency and efficiency.

### Emergency contact procedure



## INTERNAL CONTROL SYSTEM



## ENVIRONMENTAL RISK MANAGEMENT

HPC promotes autonomous environment & safety control by conducting regular inspections and monitors environment & safety control activities in order to prevent environment and safety related crises that may occur at a chemical plant. Inspection teams comprised of experts reside in all the business locations who inspect the environment & safety management status such as compliance with regulations, optimal maintenance of environment & safety facilities, whether there are any potential risk factors, and establish response systems. In addition, response scenarios for accidents such as fire and explosion are prepared according to the danger level of each production facility so that the damage can be analyzed quantitatively and response measures can be taken accordingly. In order to enhance employees' ability to respond to emergency situations each plant operates a firefighting squad, conducting training



# We will become Asia's top chemical company that practices eco-friendly and green management

## Eco-friendly Leader

From disposable syringes, cardiostimulators, playground equipment and automobiles, petrochemical products are always around us in everyday life. HPC dreams of a greener future. Recognizing our responsibility towards the environment, HPC assiduously pursues green management by establishing systematic green management structure and climate change strategies so that not only the current generation but also our children may lead eco-friendly lifestyles.

## Priority Issues

Improvement of green management system, energy conservation

### ENVIRONMENTAL PERFORMANCE IN 2010

Designated as green corporation owing to various green management activities

#### Nominated Best Enterprise in Energy Efficiency Improvement by the Ministry of Knowledge Economy

In the energy efficiency (energy consumption per KRW 1 million) survey conducted by the Ministry of Knowledge in January 2010, HPC was selected as the company with highest energy efficiency improvement at 38.9%. In addition, thanks to various green management activities including the "Energy Diet 335" campaign that aims to develop and share an item that will reduce energy consumption by 30% within 3 years and save KRW 50 billion, both Yeosu Plant and Daedan Plant were selected as green enterprises.

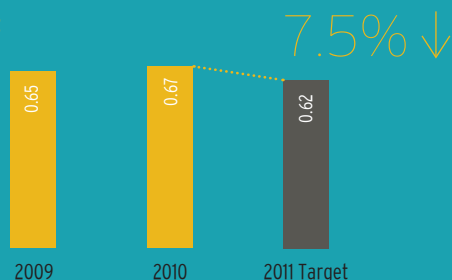
### Established close cooperation system to respond to climate change

#### Selected as Leader in Materials at the Carbon Disclosure Project

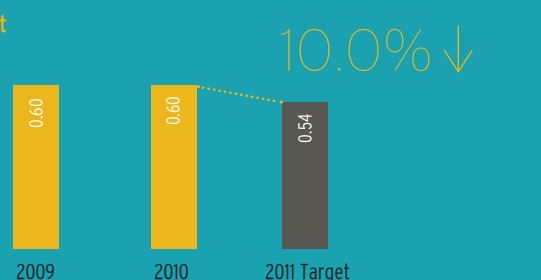
HPC is implementing various programs for reduction of energy use and greenhouse gas emissions in order to minimize the impact on climate change. HPC also maintains close cooperative relations with government agencies, Korea Petrochemical Industry Association and the Lotte Group head office to make decisions efficiently based on the latest information. In recognition of its efforts to mitigate climate change, HPC was selected as outstanding company in the Energy Saving Voluntary Agreement program, and in the CDP that HPC participated for the first time in 2010, in which it was nominated as outstanding company in the new participants sector and materials leader as well.

### Greenhouse Gas Emission Intensity (Unit : tCO<sub>2</sub>-eq/ton of production volume)

#### Yeosu Plant



#### Daesan Plant



\*In 2010, Yeosu Plant increased its use of heavy fuel which has high CO<sub>2</sub> factor, accounting for the slightly increased emission intensity.





# What is the eco-friendly material that enriches our lives?



## LOTTMER

### LOTTMER (Window Gasket)

LOTTMER shows thermosetting cross-linked elastomer properties at room temperature but melts when heat is applied which can be easily processed with thermoforming machines, and is a non-toxic environmentally friendly material that can be recycled. It is the material of the next generation that can replace soft rubber and soft PVC that are used in auto parts, construction material, industrial material, electric and electronic parts, medical supplies and household items.



## PP

### Polypropylene (IV bags, disposable syringes)

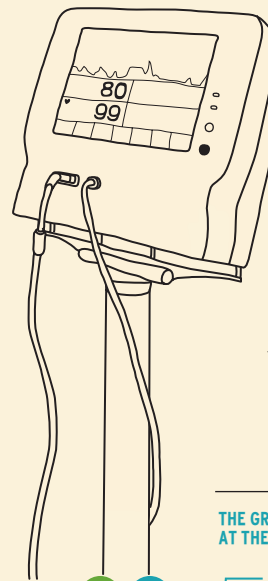
The IV bags and blood bag made of PP is an environmentally friendly material that does not leach endocrine disruptors, and has replaced PVC products containing phthalates (material suspected to be an endocrine disruptor) since October 2007.



## PC

### Polycarbonate (cardiotachmeters)

HOPELEX is the product name of HPC's polycarbonate resin, which unlike the previous product does not use phosgene during production, and is an eco-friendly polycarbonate resin that uses carbon dioxide as material. It is also a product that is produced in a clean that safe process that does not generate waste solvents or waste water.



THE GREENHOUSE GAS REDUCTION VOLUME AT THE EG AND PC PLANTS



## EG

54,443 tCO<sub>2</sub>-eq

### Ethylene glycol (blankets)

Ethylene glycol is used as material for polyester resin and fiber that is a general-purpose clothing material. HPC's MEG production volume is 6th globally and largest domestically and occupies 80% of the domestic market. In particular, the Daesan Plant employs the OMEGA process through which material consumption is reduced by 10% and 17,500 tons of greenhouse gas is reduced. HPC was the first to succeed in the commercial operation of the OMEGA process, which is all the more meaningful.



Prevention of Environmental pollution



CO<sub>2</sub> Reduce



Recycling

The polypropylene used for IV bags and blood bags is an environmentally friendly material that does not give off endocrine disruptors, and LOTTMER is also a non-toxic, environmentally friendly high-performance material that replaces PVC. As can be seen from the PC plant that adopted the non-phosgene method and the OMEGA process that was introduced at the EG plant for the first time in the world, HPC continues to adopt eco-friendly processes.

# Low-Carbon, Green Management



HPC's Yeosu Plant and Daesan Plant selected as Green Corporation in 2010

## GREEN MANAGEMENT PROCESS

In order to become Asia's top chemical company that pursues harmony between nature and mankind, HPC established a detailed green management system and devotes itself to practicing green management throughout the company from production to corporate culture. The Management Committee chaired by the CEO decides the implementation direction for green management and phased strategic tasks are established according to the 4 strategy directions. Green management related issues such as responding to climate change by each plant are discussed at the Technology Committee, and all the employees practice green management under the coordination of the Energy & Environment Team. In addition, public idea contests are held on green know-how, desirable green marketing, methodology for building a green corporation, and giving an eco-friendly image to the products, while strengthening the green management infrastructure by building an integrated green management monitoring system. As a result of its green management system and active green management activities, HPC was selected as an environmentally friendly company in 2009 and a green company in 2010. HPC will continue to implement various green management activities, fulfilling its social and environmental responsibilities as a leader of the petrochemical industry.

## GREEN MANAGEMENT STRATEGY

### VISION

Asia's top chemical company that pursues harmony between nature and mankind

With **Green** for the **Future**



**GHG.(Green House Gas) Accomplish 1830**

(Reduce GHG by 30% by 2018 based on emission intensity of 2009)

**Accomplish Green Growth 1830**

(Increase 30% of 2018 sales through green growth)

30% ↓

GHG reduction target until 2018

30% ↑

Green growth sales in 2018

<b>STRENGTHEN GREEN PROCESS</b>	Increase resources and energy efficiency/ Reduce GHG and pollutants/ Green purchasing
<b>SECURE NEW GROWTH ENGINE</b>	Enter green support business/ Develop green products and technology/ Commercial implementation of emission rights trading
<b>ADVANCE GREEN INFRASTRUCTURE</b>	Establish green management system/ Build and maintain IT management system/ Monitoring and performance evaluation
<b>FOSTER GREEN-ORIENTED CULTURE</b>	Promote communication/ Strengthen social, ethical responsibility awareness/ Response and policy measures against regulations/ Enhance green brand power

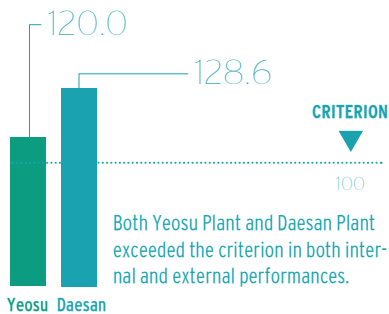
## EXTERNAL CERTIFICATION FOR GREEN MANAGEMENT SYSTEM

HPC acquired the ISO 14001 certification for environmental management system in 1995 and has established a green management system that meets global standards and entered the Sony Green Partner program, while acquiring OHSAS 18001 and KOSHA 18001 certifications. In order to enhance sustainability based on advanced green management HPC undergoes internal inspection and ISO's review each year. Solutions are established on issues that are pointed out and are reflected in the green management strategy to continually improve the green management process.

### CERTIFICATIONS

	Certification	Certifying organization	Notes
Yeosu Plant	ISO 14001	KFQ	Environmental management system
	OHSAS 18001	KFQ	Health and safety management system
	KOSHA 18001	KOSHA	Health and safety management system
	ISO 9001	KFQ	Quality management system
	ISO/TS 16949	KFQ	Automotive quality management system
Daesan Plant	ISO 14001	KFQ	Environmental management system
	OHSAS 18001	KFQ	Health and safety management system
	ISO 9001	KFQ	Quality management system
	KOSHA 18001	KOSHA	Health and safety management system
	SONY Green Partner	SONY	Customer certification
Daeduk Research Institute	Accreditation as testing and inspection institute	KOLAS	Korea Laboratory Accreditation Scheme
	ISO 14001	KFQ	Environmental management system
	ISO 9001	KFQ	Quality management system
	ISO/TS 16949	KFQ	Automotive quality management system

### 2010 Environmental Performance Evaluation



### ENVIRONMENTAL PERFORMANCE EVALUATION AND ENVIRONMENTAL ACCOUNTING

HPC conducts environmental performance evaluation and environmental accounting in order to measure, analyze and evaluate its various green management activities and reflect the results and communicate effectively with the stakeholders. The environmental performance evaluation categorizes HPC's green management activities into management performance index, operational performance index and external environmental conditions index. The evaluation criterion and weighting system was developed which expresses analysis results in indices so that the direction of the major performances and indices can be understood easily. The environmental accounting is in its early stage of implementation which identifies the environmental investment trend by cost and reflects them in the following year's decision-making. HPC will reflect the benefits of environmental investment as well so that its value as a green corporation will be widely known.

### STRUCTURE OF THE ENVIRONMENTAL PERFORMANCE EVALUATION INDEX

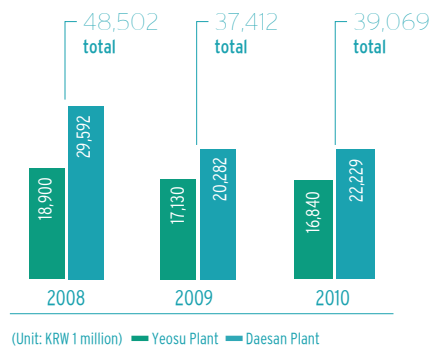
Index	Index details	Scope of evaluation
Internal MPI (Management Performance Index)	EMS	Compliance of environmental management system according to ISO requirements
	Compliance	Fulfillment of basic responsibilities through performing environmental regulations
	Environmentally friendly	Enhancement of corporate value and internal capabilities through the introduction of advance environmental management methodologies
	Relations with the community	Fulfillment of social responsibilities through community development and good relations with the residents
OPI (Operational Performance Index)	Input	Improvement activities for efficient raw materials and energy usage and cost reduction
	Output	Efforts and performance in pollutant discharge reduction and production of eco-friendly products
External ECI (Environmental Conditions Index)	Pollution status of surrounding areas	Establish pollutant control targets by assessing the pollution status of the vicinity

## Environmental Performance Evaluation Results

Index	Criterion	Criterion	Yeosu Plant			Daesan Plant		
			2008	2009	2010	2008	2009	2010
Internal	MPI (Management Performance Index)	50.0	53.6	51.2	58.4	40.8	50.4	54.0
	OPI (Operational Performance Index)	40.0	62.0	61.0	51.5	44.5	73.5	64.0
External	ECI (Environmental Conditions Index)	10.0	10.1	9.6	10.1	10.5	10.2	10.6
Environmental Performance Evaluation		100.0	125.7	121.8	120.0	95.8	134.1	128.6

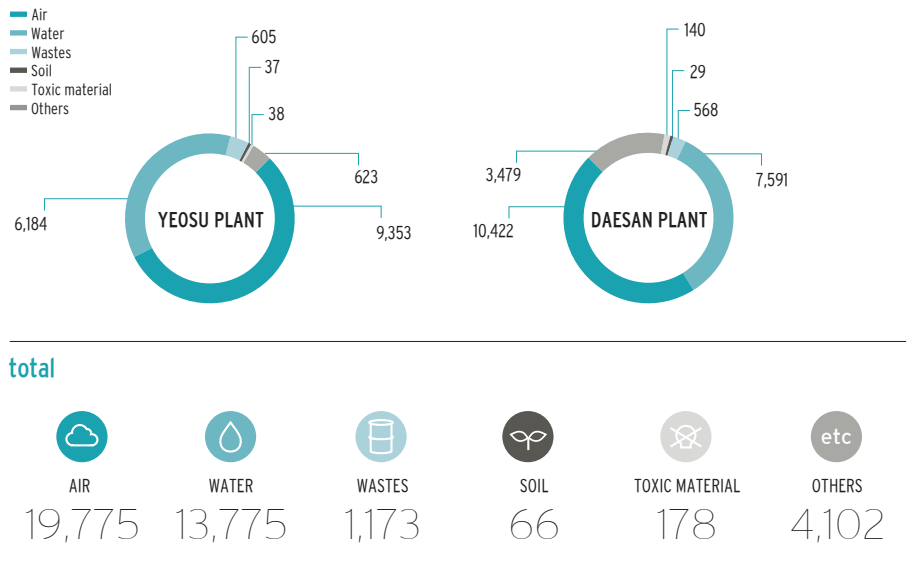
\*The environmental performance evaluation is the degree of improvement against the performance of 2004 put at 100 points.

## Yearly Environmental Investment Expenses



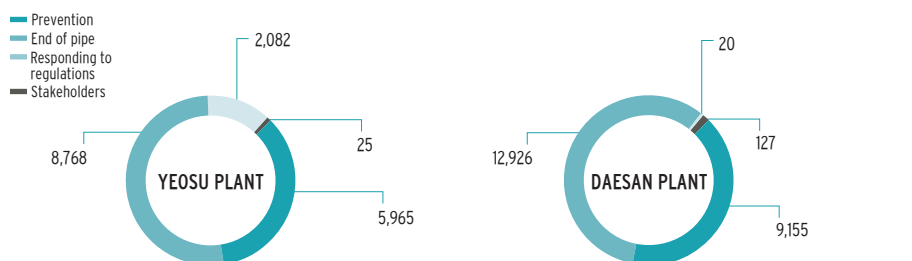
## ENVIRONMENTAL INVESTMENT BY SECTOR IN 2010

(Unit: KRW 1 million)



## ENVIRONMENTAL INVESTMENT BY COST IN 2010

(Unit: KRW 1 million)



## PURCHASING GREEN PRODUCTS

As a leading petrochemical company that cares for the environment and mankind, HPC actively pursues green purchasing. Packing materials such as palettes and cardboards, and MRO materials are replaced with recycled and eco-friendly products and the green purchasing amount is increased each year, enhancing efficiency and building a pleasant working environment.

## YEARLY GREEN PURCHASING AMOUNT

(Unit: KRW 1 million)

Year	2008	2009	2010
Green Purchasing Amount (KRW 1 million)	1,818	2,262	2,340



# Responding to Climate Change

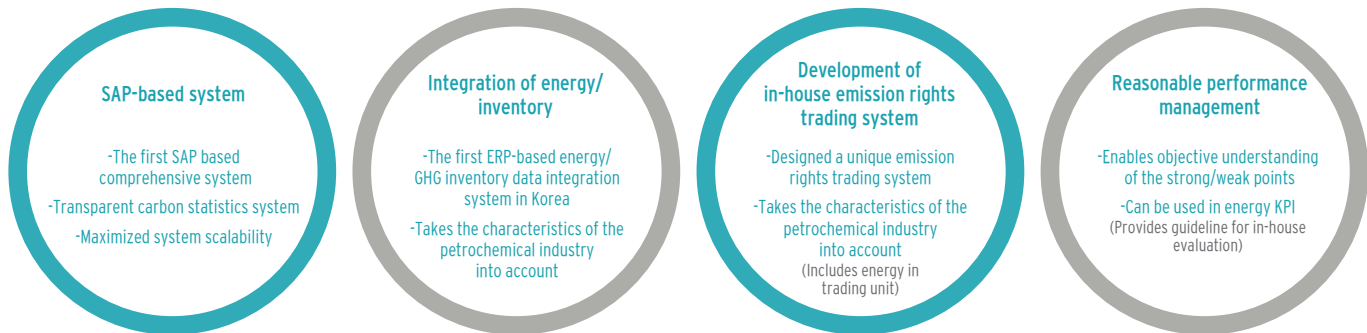
## CLIMATE CHANGE RESPONSE STRUCTURE

HPC is aware of the effects of its operations on climate change and maintains close cooperative relations with government agencies, Korea Petrochemical Industry Association to actively cooperate in the concerted efforts to mitigate climate change. The supervising department for all climate change related activities at the head office and the Energy TFT at the Yeosu and Daesan Plants are in operation to provide information on the risks and opportunities related to climate change to the executives' meeting in order to assist in quick decision-making. In 2010, Yeosu and Daesan Plants were recognized for their efforts to conserve energy and received a citation for practicing energy conservation from the Korea Energy Management Corporation, and Yeosu Plant was selected as the outstanding business site for voluntary energy conservation.

## GEMS (GREENHOUSE GAS & ENERGY MANAGEMENT SYSTEM)

For the first time in the petrochemical industry, HPC built GEMS, an accounting-based enterprise-wide integrated green management monitoring system for prior analysis of the risks related to green management such as climate change, and utilizes it in cost reduction and in identifying opportunities for green growth. GEMS is operated as an ERP (Enterprise Resources Planning) based monitoring system which analyzes and manages data on environmental performance & green management, reduced materials management, performance evaluation, in-company emission rights, energy & inventory and compliance with regulations on a real-time basis. The analysis results are reported each month, which are used for communicating with external institutions as well as internal management, and is the base data that enables HPC to accumulate sustainability capabilities based on green management.

### FEATURES OF HPC GEMS (GREENHOUSE GAS & ENERGY MANAGEMENT SYSTEM)



## PARTICIPATION IN THE CLIMATE CHANGE NETWORK

In last year's CDP(Carbon Disclosure Project), HPC was selected as outstanding newcomer as well as the materials leader. CDP is a climate change reporting system lead by a financial organization that accumulates information on organizations' governance, risks and opportunities, strategies, GHG emission accounting and communication related to the climate change issue in the form of a survey. HPC will continue to provide transparent data to the stakeholders relating its responses against climate change and spearhead the global efforts to keep the Earth green.



### YEOSU PLANT

Gaseous fuel - CH<sub>4</sub>, C<sub>3</sub>, C<sub>4</sub>  
Liquid fuel - C<sub>5</sub>, C<sub>9</sub>, PFO, MFO, NON-ARO

### DAESAN PLANT

Gaseous fuel - CH<sub>4</sub>, C<sub>3</sub>, C<sub>4</sub>  
Liquid fuel - C<sub>5</sub>, C<sub>6</sub> NA Raff, SM Reside Oil

### GHG emission reduction in 2010

#### YEOSU PLANT

67,677 tCO<sub>2</sub>-eq

9 cases registered as GHG reduction projects

131,733 tCO<sub>2</sub>-eq

Performance achieved as a subject company for energy target management pilot project

#### DAESAN PLANT

275,010 tCO<sub>2</sub>-eq

9 cases registered as GHG reduction projects

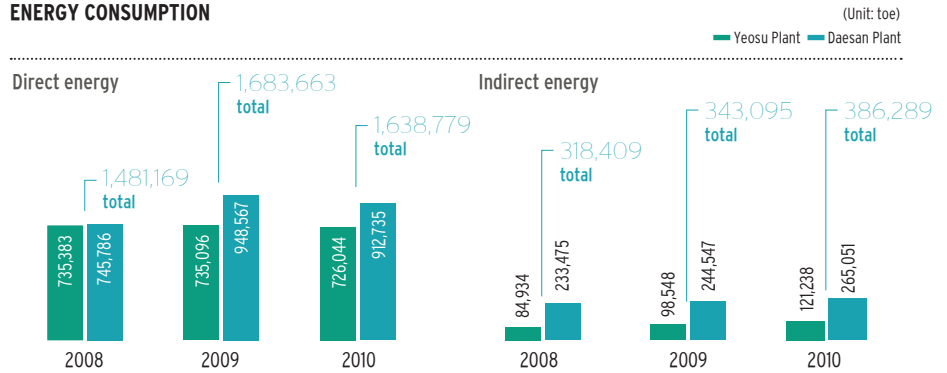
106,938 tCO<sub>2</sub>-eq

Performance achieved as a subject company for energy target management pilot project

## ENERGY CONSUMPTION

Direct sources of energy are used at the production processes while indirect energy sources such as steam and electricity are used at the production process and offices. The energy consumption in 2010 was 847,282 TOE in Yeosu Plant increasing 1.6% compared to the previous year, and Daesan Plant used 1,177,786 TOE which decreased by 1.3%. The overall energy consumption maintained similar levels from the previous year. The increased energy consumption is due to the plant expansions (butadiene plant and 3rd EOA plant), and HPC is making various investments to decrease energy usage by 3.1% compared to 2009. Energy usage at the Daesan Plant decreased thanks to identifying energy conservation items and investments, and is undertaking various programs to decrease energy usage by 4.1% compared to 2009.

### ENERGY CONSUMPTION



\*As Daesan Plant buys steam from the outside because there is no boiler, the indirect energy usage was higher compared to Yeosu Plant  
\*TOE: Tonnage of Oil Equivalent : unit of energy based on the calories released by burning one tonne of crude oil

## ENERGY MANAGEMENT

In January 2010 the Ministry of Knowledge Economy conducted an energy efficiency survey (energy usage per KRW 1 million in sales) on 10 companies with high energy consumption, where HPC was nominated as the company with best improvement results with 38.9% improvement rate. HPC operates an energy TFT at each business site to manage energy usage and the 2-man team in each department inspects the steam/water loss status and electricity conservation status of the air conditioners, heaters and office equipment. In addition, the "Energy Diet 335" campaign was undertaken, finding and sharing items that will save 30% energy during 3 years, saving KRW 50 billion, as well as promoting a green lifestyle of all the employees by maintaining office room temperature at 26°C, turning off the lights during lunch break and using personal cups. HPC promoted energy conservation by campaigns such as "Car Free Day" and "Greenhouse Event" and published a compilation booklet of energy saving activities.

## GHG EMISSION CONTROL

As the government's GHG & energy target management program came in full swing in 2010, HPC was designated as one of the subject companies, and adjusted the measurement method for direct/indirect energy consumption and GHG emissions in accordance with government standards, which accounts for the slight increase than was reported in 2009. Meanwhile, HPC participated in the pilot project for energy/GHG reduction in transportation since the end of 2010, improving the weighing process for cargo trucks. The GHG emission in 2010 increased by 4.9% compared to 2009 at 2,081,835 tCO<sub>2</sub>-eq due to plant expansions (butadiene plant and 3rd EOA plant) while Daesan Plant recorded similar emission volume as 2009 at 2,481,892 tCO<sub>2</sub>-eq. HPC puts efforts in reducing the total GHG emission as well as GHG emission intensity through continued improvement activities customized to each plant's characteristics.

### GHG Emissions

(Total emission unit: tCO<sub>2</sub>, emission intensity: tCO<sub>2</sub>/ton)

		2008	2009	2010
Yeosu Plant	Total emission	1,919,308	1,984,452	2,081,835
	Emission intensity	0.67	0.65	0.67
Daesan Plant	Total emission	2,064,889	2,472,300	2,481,892
	Emission intensity	0.69	0.60	0.60



# Resources Management

## COMPLIANCE WITH ENVIRONMENTAL LAWS

HPC observes environmental regulations during production and process management and maintains all discharges at less than 30% of discharge permission levels. HPC actively utilizes management system such as independent audits and real-time monitoring through TMS, and there has been no breach of environmental regulations in 2010 in its production and process management activities.

## RAW MATERIALS MANAGEMENT

Naphtha which is the feedstock is procured through domestic refining companies or through overseas companies, and is increasing slightly due to plant expansions and increased production volume. There are no recycled raw materials used in the process besides naphtha and HPC maximizes the efficient use of materials through production innovation activities.

### NAPHTHA USAGE

(Unit: ton/year)

	2008	2009	2010
Yeosu Plant	2,104,033	2,267,180	2,385,465
Daesan Plant	2,253,723	3,175,619	3,196,983
<b>Total</b>	<b>4,357,756</b>	<b>5,442,799</b>	<b>5,582,448</b>

## WATER MANAGEMENT

As the chemical industry requires large amounts of water Yeosu secured stable water supply from the Juam Dam, and since August 2010, retrieves the water discharged to the open ditch to the firefighting water storage tank at approximately 50 tons per hour. The main water sources for Daesan Plant are Daehoji and Boryeong Dam. In 2010, 5 petrochemical companies in the Daesan region and K-water entered an agreement for investment and operation for integrated industrial water supply, according to which the regional infrastructure was renovated and HPC secured a stable supply source of reverse osmosis processed water of 120,000 m3/day which is expected to reduce water treatment costs as well.

### WATER USAGE

(Unit: ton/year)

	2008	2009	2010
<b>Yeosu Plant</b>			
Water intake (Juam Dam)	12,302,756	11,919,824	12,200,855
Recycled water	10,212,355	10,072,506	10,200,664
<b>Daesan Plant</b>	11,896,715	13,760,614	13,961,843
Water intake (Daehoji)	6,506,642	7,004,015	7,115,787
Water intake (Boryeong Dam)	5,390,073	6,756,599	6,846,056
Recycled water	9,802,006	11,798,015	12,195,389
<b>Total</b>	<b>24,199,471</b>	<b>25,680,438</b>	<b>26,162,698</b>

\*Recycled water = water intake volume - discharged water volume



Chemicals discharge info sharing event

## Air Pollutant Discharge

(Unit: ton/year)

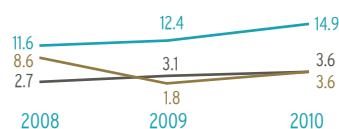
— Dust  
— SO<sub>2</sub>  
— NO<sub>x</sub>  
— CO

### YEOSU PLANT



2008 2009 2010

### DAESAN PLANT



2008 2009 2010

The difference in discharge amount is due to whether there is a boiler within the plant.

## AIR POLLUTANT CONTROL

HPC is reducing air pollutant discharge at the source through continued process improvements. In the case of Yeosu Plant the TMS (tele-monitoring system) were installed at all the major discharge outlets for 24-hour environmental monitoring. In 2010 the sulfur content in naphtha increased as well as in the PFO that is used as boiler fuel, resulting in the overall increase in SO<sub>x</sub> discharge. As for Daesan Plant, no TMSs were installed as there are no facilities subject to legal control, but regular independent measurements are taken for all other facilities. The generated pollutants are treated at the anti-pollution facilities and those facilities are regularly inspected to maintain optimum operating conditions. The pollutant concentration is automatically recorded and the alarm goes off in case they exceed control limits, enabling an early response.

## REPLACEMENT VOLUME OF OZONE DEPLETING SUBSTANCES (SF6)

(Unit: kg/year)

	2008	2009	2010
SF6	732	804	804

\*HPC uses materials with low ozone depletion potential in all its processes

## TOXIC SUBSTANCES MANAGEMENT

As part of its efforts to reduce the discharge of toxic chemicals, HPC signed the "Voluntary Agreement for Reduction of Chemicals Discharge" with the Ministry of Environment, and continues to invest in discharge reduction facilities such as detectors and shut-off equipment while thoroughly monitoring discharge sources. Through thorough control of toxic substances there has been no leakage, but HPC conducts prior control activities so that quick response will be possible in case of leakage accidents. In particular, Daesan Plant in implementing the LDAR (Leak Detection and Repair) system since 2006 in order to prevent leakage of arsenic acid which occupies more than half of the air polluting substances. With the installation of RTO (Regenerative Thermal Oxidizer) in the waste treatment facility and product storage facility and introducing the LDAR system at the ethylene factory toxic materials discharge has decreased by 22%. The LDAR system is a method of improving leakage through regular monitoring and repair of the hundreds of thousands locations where arsenic acid may leak, and is connected to an IT system for automatic monitoring.

## DISCHARGE OF TOXIC SUBSTANCES

(Unit: ton/year)

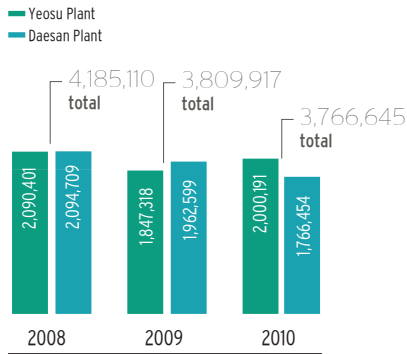
	2008	2009	2010
<b>Yeosu Plant</b>	<b>78.4</b>	<b>77.8</b>	<b>78.1</b>
Ethylene	5.5	5.2	5.5
Propylene	6.2	4.9	6.5
Others (33 kinds)	66.7	67.7	66.1
<b>Daesan Plant</b>	<b>124.2</b>	<b>130.6</b>	<b>101.8</b>
Ethylene	27.1	27.4	17.8
Propylene	18.8	27.0	24.5
Others (22 kinds)	78.3	76.2	59.5
<b>Total</b>	<b>202.6</b>	<b>208.4</b>	<b>179.9</b>

\*The difference in the discharge amount between Yeosu and Daesan plants are due to different production volumes.

## MANAGEMENT OF REGIONAL ENVIRONMENT

The areas where HPC's operation sites are located are industrial zones with high concentrations of industrial facilities, and are not inhabited by endangered species nor do they have high value in view of biodiversity. However, HPC regularly monitors ecological changes in consideration of the regional characteristics so that there are no adversely affected areas caused by water intake or business operations. The volunteer groups for each region actively participate in environment protection activities, taking extra care to protect the surrounding environment.

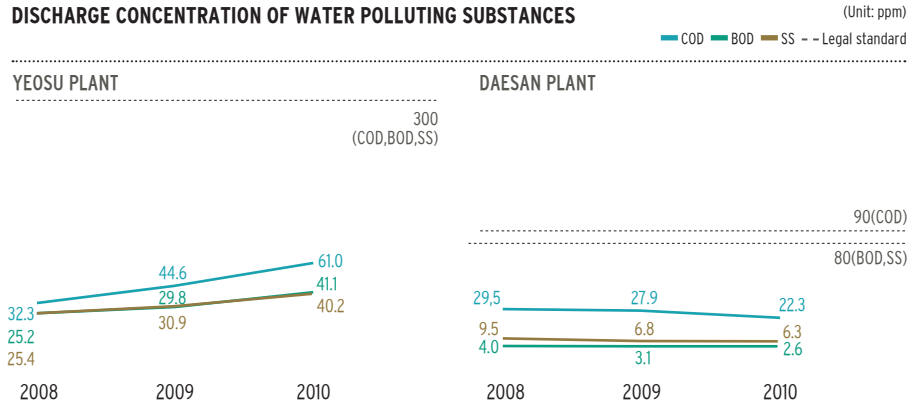
### Waste water discharge volume (Unit: ton/year)



### WATER POLLUTANTS MANAGEMENT

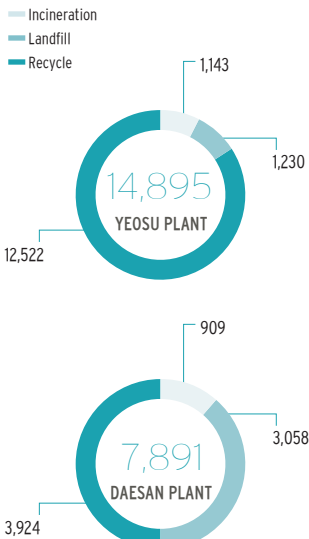
The waste water generated at the Daesan Plant undergoes final treatment within the plant through the physicochemical treatment facility and pure oxygen activated sludge system, while Yeosu Plant commissions the sewage treatment facility operated by the municipal government. Surveys show that there has been no body of water affected by HPC's operations. In addition, HPC is decreasing water usage through the waste water recycling process as well as reducing waste water discharge and water pollution. In 2010, all the locations that generate waste water or rain water have been inspected in order to prevent the flow of rain water into waste water, and the EG facility improvement (replacement of tower internal) at the Daesan Plant has reduced the volume of waste water generation and pollutant concentration (COD).

### DISCHARGE CONCENTRATION OF WATER POLLUTING SUBSTANCES



\*The discharge concentration of water polluting substances have increased at Yeosu Plant due to launching of the new plant which increased the waste water volume and load.

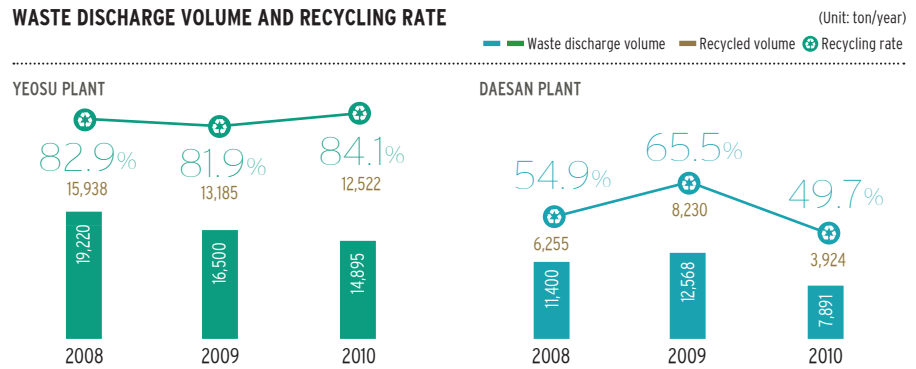
### Waste Treatment Volume in 2010 (Unit: ton/year)



### WASTE MANAGEMENT

HPC operates a waste naming system to identify the location and type of waste and offers training to the employees on the proper waste treatment method to foster awareness on waste reduction. The waste packing material are mostly returned to the recycling companies, and the waste generated at Yeosu and Daesan Plant decreased by 9.6% and 37% respectively in 2010. The difference between the two plants is due to their respective characteristics. At Yeosu Plant the polymer process generates recyclable scrap and more waste EG is generated compared to Daesan plant. Thus the overall waste volume as well as recyclable resources are greater compared to Daesan Plant.

### WASTE DISCHARGE VOLUME AND RECYCLING RATE



\*The waste generation at Yeosu Plant decreased by 9.6% compared to 2009 thanks to process improvement, facilities investment and management activities. The composite resins that were incinerated are thoroughly separated for recycling, and efforts are taken to find more recyclable wastes.

\*New expansions and repair that took place between 2008 and 2009 resulted in over-generation of recyclable construction wastes, accounting for the temporary increase of the waste volume and recycling rate.

### SOIL MANAGEMENT

HPC has established an internal soil pollution management guideline and covered all the areas subject to soil contamination with concrete and waterproof treatment so that pollutants may not seep into the soil. HPC prevents soil contamination through sufficient prior assessment and preventive measures.

# Product Ecobalance Management

## RESPONDING TO CHEMICALS REGULATIONS

Following EU's REACH, China, Japan, and more recently Taiwan and the U.S. are joining the move to regulate chemicals, tightening the regulations on the petrochemical industry. EU is steadily strengthening its regulation against highly toxic substance content, and China is enforcing environmental regulations and restrictions against environmental hazards caused by new chemical substances. Taiwan, Japan and the U.S. either introduced similar laws or are in the process of introducing them. HPC constantly monitors various countries' trend in chemical substance regulation and takes proactive measures.

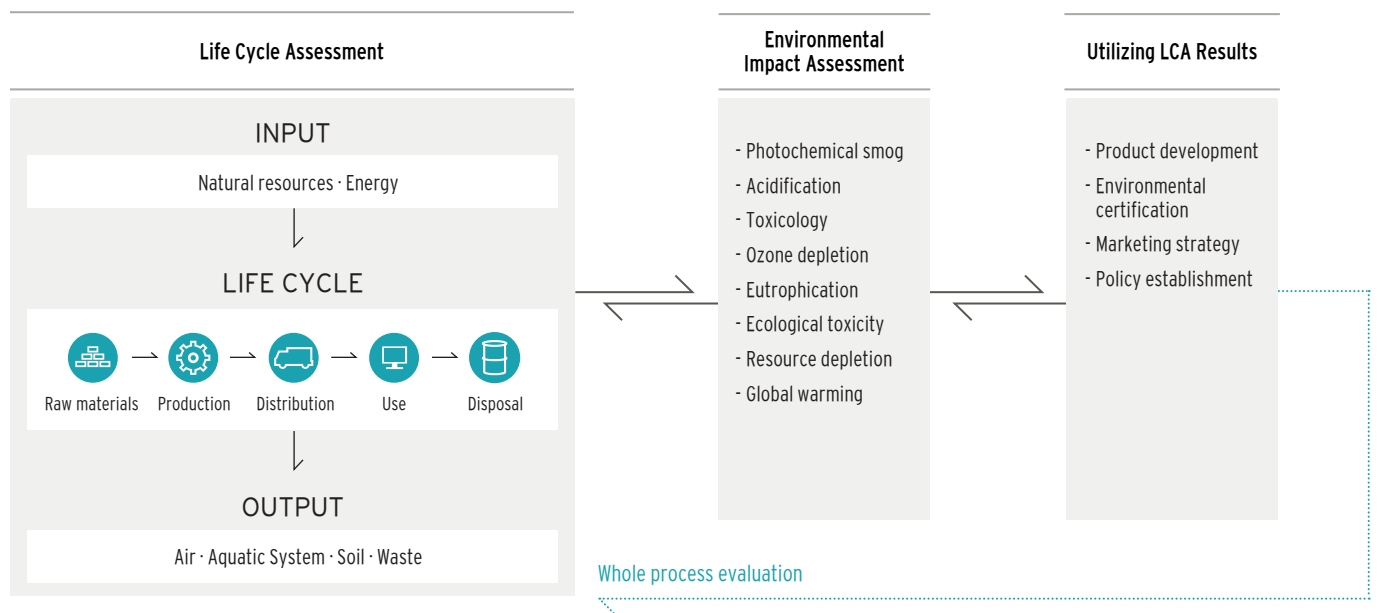
\*As a response to REACH, HPC completed registration of 8 substances out of 11 that are subject to registration through Only Representative of U.K. to ensure there are no adverse effects in the export of HPC's products or derivative products to Europe.

## LIFE CYCLE ASSESSMENT

HPC quantifies and analyzes all the resources, energy and pollutants that are put in or generated throughout the life cycle of its products through the Life Cycle Assessment technique. HPC forecasts and analyzes the environmental impact of the production activities, assesses the materiality of the environmental impact element and manages them according to the order of priority. At the beginning stage of plant expansion or a new business the impact on the local community is assessed and appropriate measures are taken, while during the design phase eco-design is adopted to prevent environmental or social detriments.

In 2010, LCA was conducted on EG, PE and PP and the results are currently being analyzed. HPC will reduce environmental impact through technology development to optimize fuel and material input and taking appropriate response measures.

### LIFE CYCLE ASSESSMENT



# We will become Asia's top chemical company that leads the future trend through creative technology development

## Mega-trend Leader

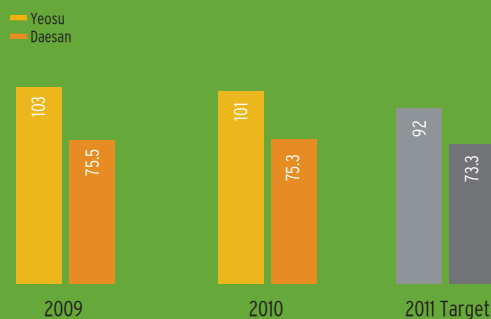
The future for the petrochemical industry has no boundaries. Our lives will become more convenient and more abundant. The petrochemical industry is a high value-added industry that creates 10~100 times the value of input raw materials through core technologies. In order to secure the engine for future growth, HPC will cultivate petrochemicals as Korea's leading industry and an environmentally friendly industry by enhancing global competitiveness, developing commercialization technology for new materials, and cultivating core businesses such as "green" materials and mega-trend businesses.

## Priority Issues

R&D investment and development of new technology, building business infrastructure for global business, development of eco-friendly products, increasing production capacities, cultivating new businesses, mutual growth with partner companies

### Production capacity for ethylene (Unit: 100k tons)

Due to the regular maintenance of Daesan Plant, a decrease in ethylene production capacity and workdays is expected, and shutdowns due to minor maintenance jobs were considered for the Yeosu Plant as well.



### Non-stop operation of Yeosu ethylene plant

2000 days

### Non-stop production volume of ethylene for 2 years at Daesan Plant

1 million tons

### INDIRECT ECONOMIC EFFECT IN 2010

#### Local job creation effect of 100,000 persons annually

#### Increased local employment owing to expansion of Yeosu Plant

HPC is investing KRW 520 billion until December 2012 to expand the NCC, PE and PP facilities. HPC signed an MOU with Yeosu City regarding plant expansion and recruits local workers first for construction, which is expected to bring an annual employment effect of 100,000 jobs during the construction period, and when construction is complete more than 50 jobs will be created.

#### Partner company support effect amounting to KRW 61 billion

#### Economic and technical support for partner companies through win-win cooperation programs

HPC provides economic assistance to partner companies (75% of which are SMEs) through raising KRW 25 billion as mutual growth fund and pledged to contribute KRW 36 billion to the Large-Medium-Small Enterprise Mutual Growth Fund project. In addition, in order to help technology specialized companies that lack marketing and industrial design capabilities, HPC helps commercialize partner company products through joint production technology development with research institutes and provides support in marketing, searching for various means to provide practical support for partner companies.







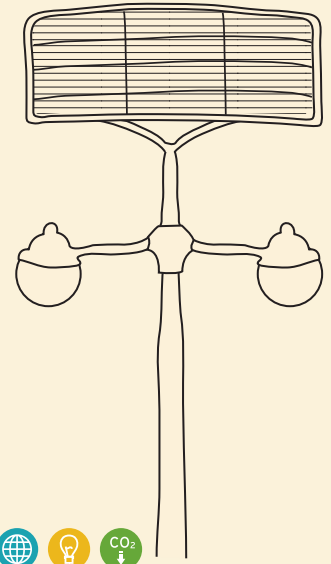
# What does the state of the art material that will lead the future trend look like?



## EVA

**Ethylene-vinyl acetate copolymer**  
(photovoltaic module sheets)

EVA sheets are placed at the front and back of a fuel cell and acts as a buffer to protect the wafers from damage and the glass in the front is glued with the sheet at the back to seal the module to lengthen its life.



## WLFT (\*Please see P34)

**Woven-Long-Fiber-reinforced Thermoplastic** (beam)

WLFT is a composite made by combining WFT and LFT. The hybrid structure of the two materials makes it into a light weight material with high strength and resistance to cold and heat.

## PIA

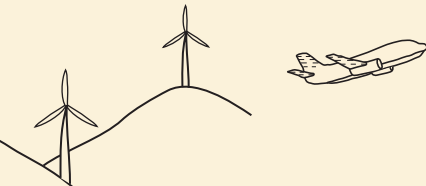
**Purified Isophthalic Acid** (car paint)

PIA, which uses MX as material is a technology-intensive product that only 7 companies in the U.S., Belgium, Japan, China, Spain, Singapore, and Korea can produce, and is used for PET bottles, car and ship paint, adhesives, coating material, mattress and sanitation products, and was designated as a Korean World-Class Product by the Ministry of Knowledge Economy in 2003.



**Expanded Polypropylene**  
(beam, door panel)

EPP can be produced in various forms, and the product has mechanical properties, thermal resistance, chemical resistance and repeated shock absorption, HOWPOL is the product name of the EPP product developed by HOWTECH which is produced in an eco-friendly process that does not use harmful substances nor discharge any waste water.



## Carbon Fiber

**Carbon composites**  
(wind turbine blades, aircraft wings)

Carbon fiber is a lightweight material of the future that has strength and elasticity 4 times greater than steel and weighs less than 50% of aluminum. Carbon composites using carbon fiber are used as aircraft parts, large wind turbine blades automobile parts.



## Nano PP

**PP Nanocomposite** (side molding)

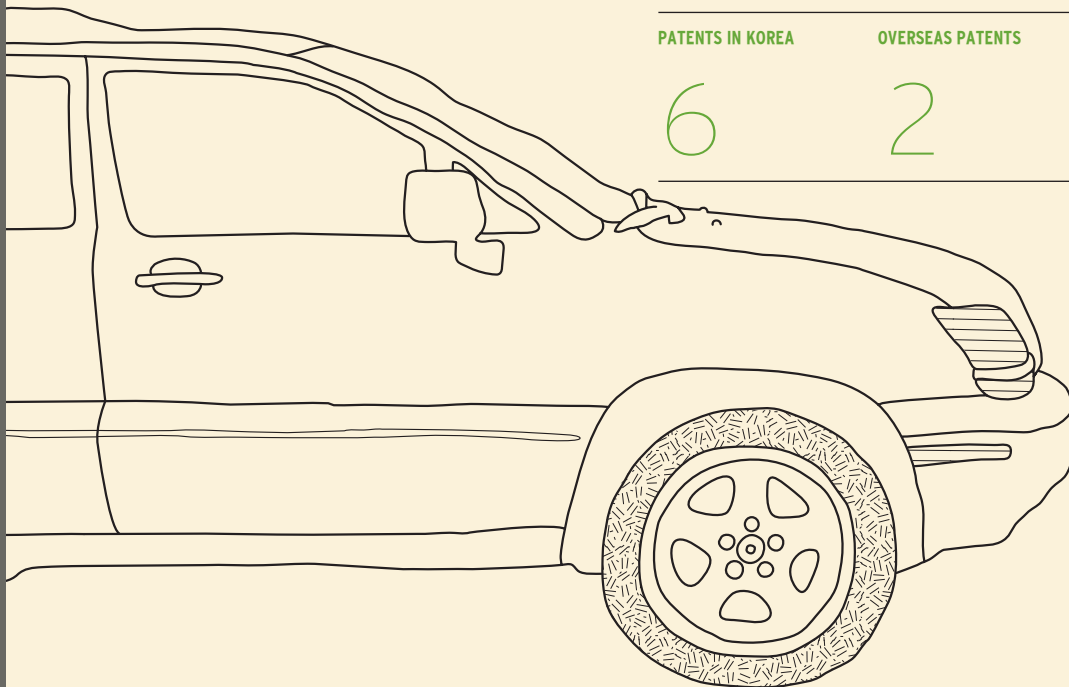
The polypropylene nanocomposite is a material made by replacing the conventional inorganic filling used in composites with nanoclay. Only a small amount has the same or higher strength which can reduce the automobile weight and the weight transferred to the frame is reduced as well, improving durability. It is an important new material that improves mileage and reduces greenhouse gases, and HPC has 6 patents in Korea and 2 patents overseas. (\*Please see P34)

PATENTS IN KOREA

OVERSEAS PATENTS

6

2



Prevention of Environmental pollution

Energy-saving

CO<sub>2</sub> Reduce

PP Nanocomposites is a material made by combining nanoclay which is a nano material with polypropylene and is lighter yet stronger than existing materials. The PP nanocomposites contributes to the environment by improving durability, parts longevity and mileage as well as reducing CO<sub>2</sub> emission by reducing 20% of weight.



## Interview with Mega-trend Leader

In order to help stakeholders in understanding new technologies and present a blueprint of the future, we paid a visit to HPC's Daeduk Research Institute that spearheads the development of light weight plastic automobile parts through the development of composites technology. The interview was conducted on director Lee Dongu and members of the Research Team #3 for approximately two hours, on the technology development status that will cultivate the future growth engine, the meaning of light weight automobile parts, and the leadership role of the industrial sector.

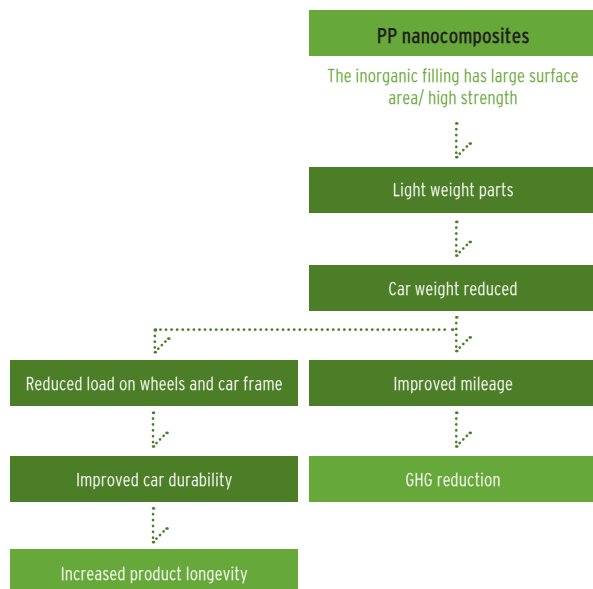
# Daeduk Research Institute prepares for a sustainable future of the industrial sector through new materials development

## What is PP Nanocomposites and what are its merits?

We expect improved part longevity and mileage owing to lighter weight and higher durability.

PP Nanocomposites means nano-material (nanoclay) were used instead of the conventional inorganic filling for the composites that are used to make plastic auto parts. Because of the large surface area, adding only a small amount of the nano-sized inorganic fillings has the same effect as adding large amounts, which makes it possible to realize strong mechanical strength with only a small amount of additives. As only a small amount of filling is added the part produced is lighter, and the overall weight of the automobile is reduced, which in turn reduces the car's fuel consumption. Naturally, mileage improves, CO<sub>2</sub> emission is reduced and the car durability is improved as well because the weight load on the car frame decreases. Thus, the life cycle of metals and plastics becomes longer.

The core technology of PP nanocomposites lies in how well the nanoclay is dispersed. Due to its small size, there are limits in their dispersion with conventional technology. HPC has developed the compatibilizer that enables the even dispersion of nanoclay in the composite without clotting. This was possible because HPC has its own compatibilizer synthesizing facility (MPO). HPC is the only Korean company that has a plant that can synthesize compatibilizer in a reactor. In addition, for the high dispersion of nanoclay, HPC introduced the 12-axis extruder that has longer residence times and shear stress than its predecessors. The "nanoclay 40% masterbatch" produced is mixed with polypropylene and rubber to be transformed into PP or composite with 5~7% of nano-material, then delivered to the auto parts producer where it is molded into parts. The PP nanocomposites technology development has currently been completed and will be commercially applied soon.





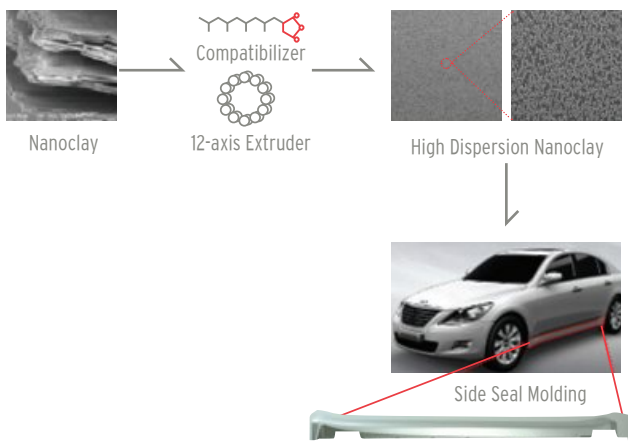
*The core technology of PP nanocomposites lies in how well the nanoclay is dispersed. This was possible because HPC has its own compatibilizer synthesizing facility (MPO) ..... Research Team #3, Director Lee Dongu*

### What technology are you focusing on for HPC's sustainable future?

We are preparing for a sustainable future not only for HPC but for the industrial sector as well through the development of advanced materials.

Although technology development is going on in various fields at HPC, the area it will focus is the advanced materials sector. Advanced materials are divided into carbon/nano materials for automobiles and aircrafts, electric and electronic materials, special packing materials and eco-friendly materials, and the PP nanocomposite can be categorized as a carbon/nano material for automobiles. Although HPC is making sound profits from basic chemicals such as PP and PET, in order for it to grow as a global chemical company, the development of advanced materials such as performance polymer is necessary. Advanced materials development is an important responsibility that only a materials company can undertake, and from the purchasing companies' view, if materials companies do not develop new advanced materials it may affect them as gravely as to diminish their competitiveness. In addition, the development of advanced materials brings mutual growth in related industries such as raw and subsidiary materials companies and advanced material processing companies and can bring job creation effects as well. HPC strives to display leadership by developing advanced materials faster than competitors, enhancing its competitiveness and in turn the competitiveness of the whole industry.

Flow chart from nanoclay to automobile parts



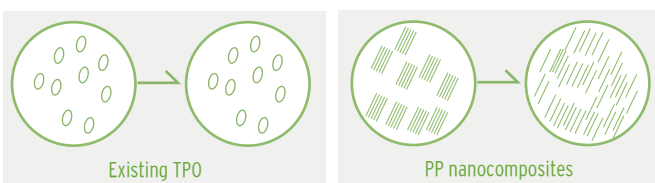
### How many new technologies does HPC own?

The source of HPC's competitive edge is in the active research and development of new technologies.

As HPC believes the source of competitiveness to be in new technologies, it invests even more aggressively during hard times. As of December 2010 HPC owns 155 patents and 3 utility models including the domestic patent for PP nanocomposites, as well as 16 overseas patents.

PP nanocomposites acquired the Second New Technology Certification in 2009, was selected as one of the 23 Best Industrial Accomplishments by the National Academy of Engineering of Korea, and was included in the 100 Outstanding Projects by the Ministry of Knowledge Economy. Moreover, HPC has registered 6 domestic and 2 overseas patents related to PP nanocomposites.

PP nanocomposite's improved properties compared to existing TPO





**It must be important to secure expert capabilities if in order to undertake technology development and research projects.**

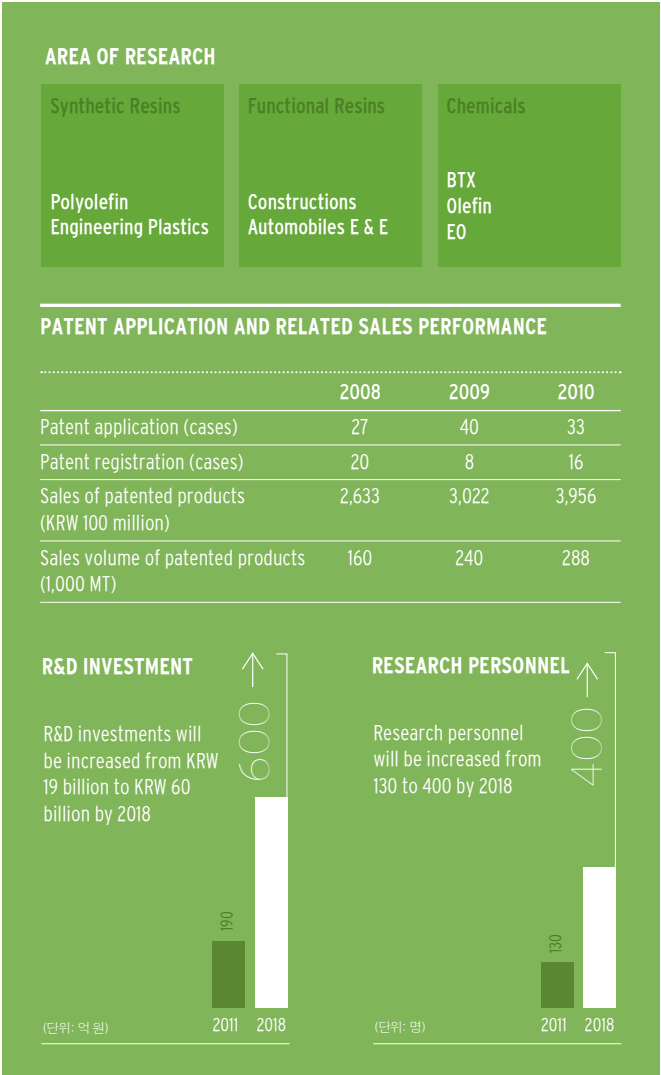
HPC's Daeduk Research Institute has been certified as a testing laboratory, and is currently expanding its research facilities.

HPC Daeduk Research Institute was accredited as a testing laboratory by KOLAS in 1997, and is an institute with an analysis system that gained permission to use the ILAC-MRA Mark from ILAC in 2005. Currently there are over 130 expert personnel, over 100 types of analysis instruments, more than 300 processing instruments and material property measurement equipment. Daesuk Research Institute plans to expand the number of researchers from 130 to 400 by 2018 in order to enhance its capabilities as HPC's future growth engine, and R&D investment will be increased from KRW 19 billion to KRW 60 billion. In addition, a new research wing with 12,000m<sup>3</sup> total floor area is to be completed by 2012. Daeduk Research Institute maximizes research performance through not only independent research and development but also by undertaking government projects and joint research with external institutes, and operates a program to cultivate KAIST doctors and an industry scholarship.

**Does R&D capability affect partner companies as well?**

HPC conducts product analysis commissioning of partner companies' major products and joint research for win-win cooperation with the stakeholders, and contributes to creating the initiative for future growth of the petrochemical industry. In 2010 the product developed through joint research between HOWTECH, HPC's subsidiary that possesses expanded PP technology, GPS Korea which specializes in molding and Daeduk Research Institute succeeded in commercialization and entered the market. This product involves a new eco-friendly technology that uses CO<sub>2</sub> as Blowing agent and reduces production cost as well.

HPC conducted joint technology development with a partner company as well as providing support for the product design, marketing and sale, successfully supplying the developed product to a logistics company to be used as packing material for high quality meat products. In order to contribute to the sustainable growth of the chemical industry, HPC will expand its commissioned/joint research projects, and further enhance win-win support activities to help partner companies in industrial design and marketing.





(from top)  
EVA, Nano PP Compound, Nano Clay

## What is the direction and target for advanced materials development in the future?

We will expand development of advanced materials using nanoclay as well as eco-friendly materials using carbon fiber, that will be HPC's new growth engine.

PP composite resins have good mechanical strength relative to their price and an eco-friendly material that are easy to recycle, which are mostly used in the car and electronics industry. As approximately 100kg of plastic goes into a single car, we have applied PP nanocomposites technology to the automobile sector to make light parts with high durability. Besides the PP nanocomposites technology, HPC is in its final stages of research for nano-nylon6. Nylon6 is made when a heptangular molecule containing 6 carbons called caprolactam opens. When a small amount (4%) of nanoclay is added the high dispersion improves its heat resistance by about 100°C which was one of its weak points, and the mechanical strength is increased by about twofold. Until now large amounts of inorganic fillings were added to improve mechanical strength which made it much heavier. Nano-Nylon6 contains only a maximum 4% of nanoclay, making it all the more lighter. In order to build a sustainable company in the age of low-carbon, green growth, HPC Research Institute has identified eco-friendly materials development as the source of new growth, and devotes itself to the research and development of long fiber technology that will replace metals to be used in automobile bumper back beams, material for the rotating drum in washing machines and the blades for 5MW wind turbines using carbon fiber.

### LIGHT WEIGHT AUTOMOBILE PARTS

WLFT LFT

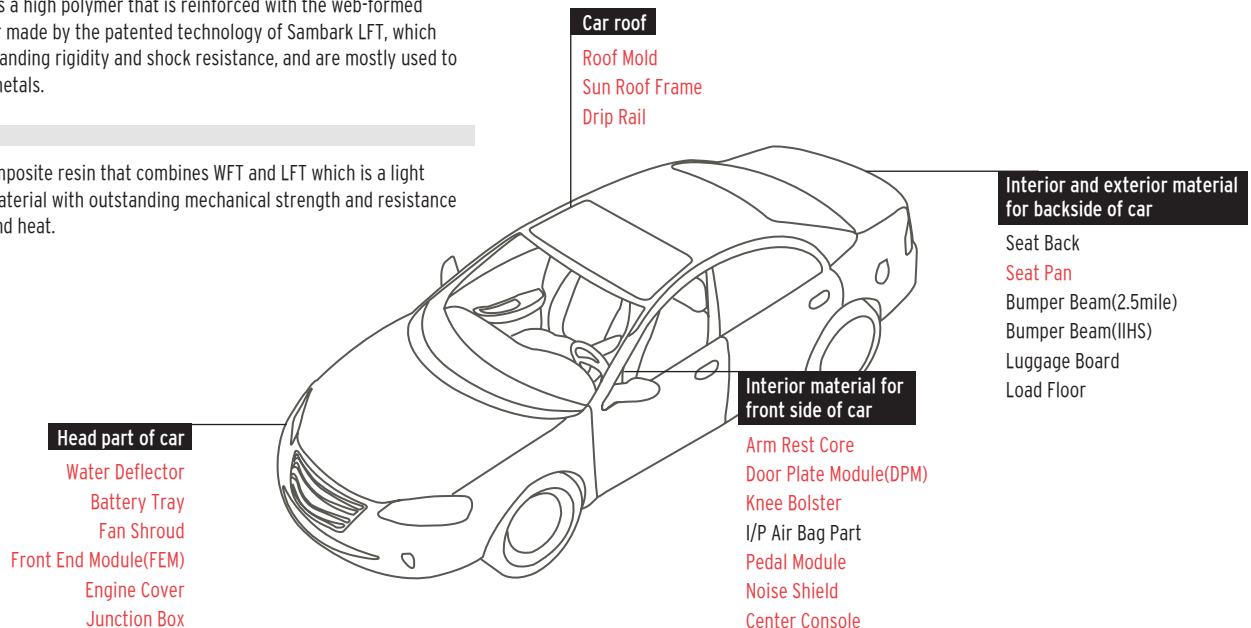
#### LFT

##### Long Fiber Thermoplastics

SUPRAN is a high polymer that is reinforced with the web-formed long fiber made by the patented technology of Sambark LFT, which has outstanding rigidity and shock resistance, and are mostly used to replace metals.

#### WLFT

It is a composite resin that combines WFT and LFT which is a light weight material with outstanding mechanical strength and resistance to cold and heat.





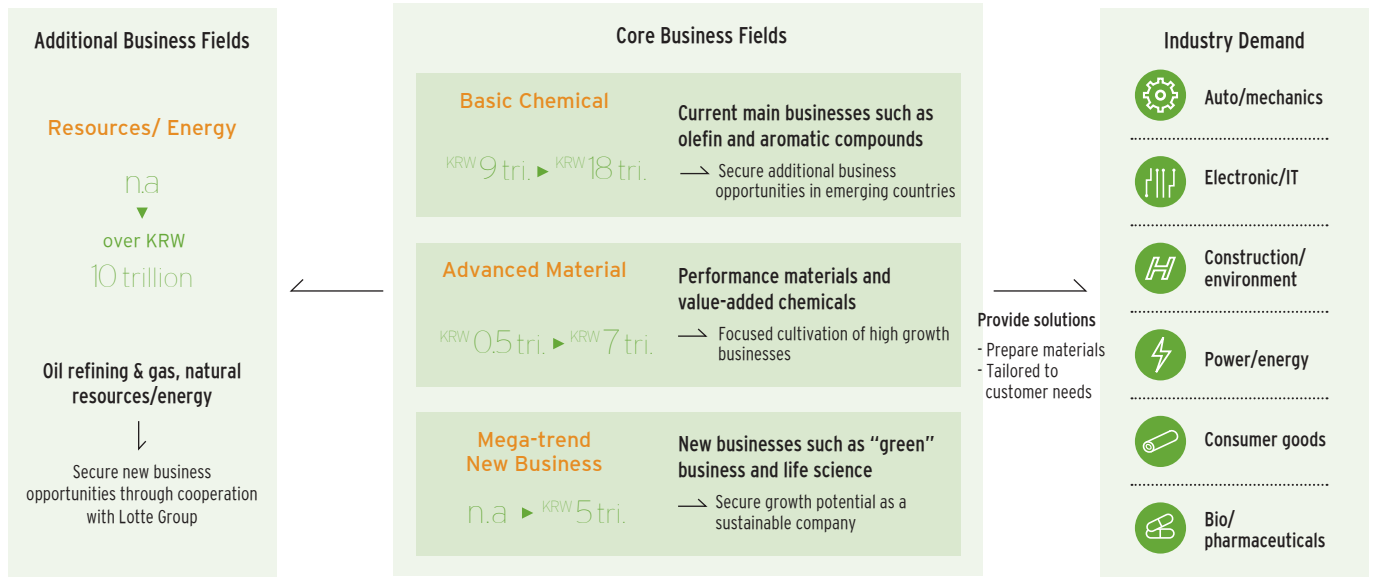
# Innovative Management

## FIELD OF CORE BUSINESSES

HPC has selected "Basic Chemicals," "Advanced Materials" and "Mega-trend New Business" as its 3 core business areas. In order to achieve KRW 40 trillion in sales by 2018 with these key businesses, HPC will cultivate the performance polymer business which is in its early stage, establish detailed strategies for mega-trend businesses such as "green" materials, recruit global experts to lead the new business, and devote itself to R&D.

### BUSINESS STRATEGY

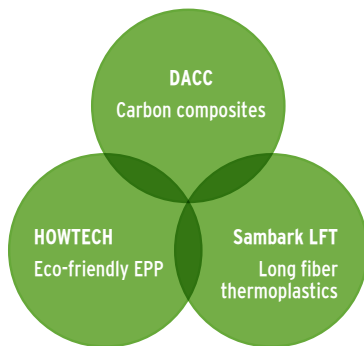
(Sales: '09 → '18)



## M&A

In July 2010, HPC acquired Titan Chemicals, Malaysia's largest petrochemical company at KRW 1.5 trillion. Titan is one of the leading petrochemicals company of Southeast Asia that occupies 40% of Malaysia's PO (polyolefin) market and 30% of Indonesia's PE (polyethylene) market with an annual production capacity of 720,000 tons of ethylene and 480,000 tons of PP (polypropylene). With the acquisition of Titan, HPC secured a foothold in Southeast Asia which is a key logistics point as well as an economy of scale, and expects regional integration and synergy in purchasing and sales.

With a view to cultivating the next generation advanced materials business, HPC acquired DACC Custom Composites in August which specializes in carbon composites. Carbon fiber is the material of the next generation which boasts strength and elasticity 4 times greater than that of steel and is 50% lighter than aluminum. It is expected to be widely popular as aircraft parts, large wind turbine blades and in the automobiles industry. As HPC had already acquired HOWTECH which produces EPP and Sambark LFT that produces long fiber thermoplastics, DACC's acquisition has further strengthened HPC's position in the highly advanced materials field, and plans to cultivate carbon composites as a major business that will bring more than KRW 200 billion in sales.



**A total solution provider for highly advanced materials**



## ENHANCING GLOBAL COMPETITIVENESS IN BASIC CHEMICALS

In order to respond to the exponential increase in demand in China for PP that is used in cars and electronic appliances, Jiaying Honam Engineering Plastics which is HPC's production and sales branch for PP, increased the production capacity from 17,000 tons to 25,000 tons. The ETA production plant is under construction near the Jiaying Honam Engineering Plastics which will be completed in 2012, and a joint project for EO (ethylene oxide) plant is under way. In addition, HPC is expanding its overseas production volume, including plans to construct a compounding plant in Beijing that will produce 10,000 ~ 15,000 tons of ABS (acrylonitrile butadiene styrene), MMA (methyl methacrylate) and PP. For the first time among chemical companies, HPC is preparing to enter the eco-friendly materials market for electronic parts and light weight auto parts in Alabama. HPC is also actively diversifying its supply route to emerging markets including Indonesia, India and Africa, and strives to foster global competitiveness based on a global business mind, requiring the use of English or the local language for written or telephone communication between the head office and overseas branches.

## COMMERCIALIZATION TECHNOLOGY FOR ADVANCED MATERIALS

HPC's first area of focus is light weight auto parts and is developing low-pollution and light materials that will replace steel and glass parts, based on "eco-efficient materials." Based on the automobile materials business, HPC will grow from an advanced materials company to a comprehensive materials supplier.

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- **LFT (long fiber thermoplastic):** LFT is used for high strength, light-weight material for automobiles and home appliances. LET is a composite material which can be injection-molded, and the web-formed long fiber greatly enhances rigidity and shock resistance

- **PP nanocomposites:** PP nanocomposites is an eco-friendly flame resistant plastic that is used for internal and external light weight auto parts for which HPC is currently preparing commercialization. The nano-clay that is a nano-material used in PP nanocomposites makes it light yet strong, which contributes to improved car mileage owing to lighter auto parts.

- **LOTTMER (Lotte + Elastomer):** LOTTMER is a non-toxic thermoplastic elastomer that can replace PVC and applied to automobiles, construction, medical equipment and household items. It shows thermosetting cross-linked elastomer properties at room temperature but melts when heat is applied which can be easily processed with thermoforming machines and is a non-toxic, eco-friendly and recyclable product.

- **Carbon fiber:** Carbon fiber is a lightweight material of the future that has strength and elasticity 4 times greater than steel and weighs less than 50% of aluminum. Carbon composites using carbon fiber are used as aircraft parts, large wind turbine blades automobile parts.

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## FOSTERING MEGA-TREND NEW BUSINESSES

HPC is broadly considering the direction for green businesses such as large scale-energy storage cells that is emerging as a highly potential new growth engine of the next generation. The zinc-bromine chemical flow battery that HPC is planning to develop is a large-scale battery that stores solar or wind energy, and the ultra-large-scale battery has the storage capacity of hundreds of secondary automotive batteries. With the goal of developing the "third generation zinc-bromine chemical flow battery" with 500kWh capacity ready for commercialization by 2012, HPC plans to conduct a business plausibility analysis through a verification project linking with wind and solar power facilities. HPC plans to achieve KRW 400 billion ~ KRW 500 billion in the chemical battery business by 2015 through continued improvement to the business plausibility.



### PARTICIPATED IN CHINAPLAS

Chinaplas is Asia's largest plastic and rubber exhibition that began in 1987 where over 2,000 companies from 35 countries participate to show their new products and technologies, and is one of the 3 major petrochemical expos along with K Fair of Germany and NPE of the United States. At the 2010 exhibition that was held under the theme of "Green plastics, Our goal, Our future," various petrochemical raw materials and machinery in 9 industrial categories were exhibited. HPC has been participating since 2006, and in 2010, divided its booths into 3 categories; High Performance area, Engineering Plastics area and Poly Olefin area which was the booth for basic materials. At the 2010 Chinaplas, advanced materials related to the automobile industry emerged as the key center of attention due to the expected growth of China's automobile market. In particular, many buyers came and showed interest to the HP booth where the car door module that HPC succeeded in commercializing for the first time in the world was displayed. Through the exhibition HPC showed its advanced technology and secured a foothold to enter the Chinese market.

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# Stable Production & Supply Capacity

2,000 days

Ethylene factory at Yeosu Plant reached 2,000 days of non-stop operation

1 million tons

Daesan Plant produced 1 million tons of ethylene for 2 consecutive years

## INCREASING PRODUCTION CAPACITY

HPC is investing KRW 520 billion in Yeosu Plant from 2010 to 2012 to expand the NCC, polyethylene and polypropylene production facilities. With the expansion of the NCC, the annual ethylene production will increase from 750,000 tons to 1 million tons, which added to Daesan Plant's 1 million tons and Titan's 750,000 tons, HPC's annual ethylene production capacity will reach 2.72 million tons. When the expansion construction for 250,000 tons of PE and 200,000 tons of PP is complete, the total capacity for PE will be 2.05 million tons and PP 1.56 million tons. Meanwhile, the 130,000 ton facility for butadiene(BD) and butene-1 was completed in Yeosu, which will enable HPC to meet the increased demand owing to its active expansion to overseas markets and enhance its global competitiveness.

## SECURING RAW MATERIALS SUPPLY

For the stable supply of raw materials to meet increased production capacity, HPC is actively investing in securing low-cost raw materials. HPC is investing in the Surgil project in Uzbekistan and looking for ways to enter into the Middle East region to secure cost competitiveness. The Surgil project integrates the development, production, construction and operation of the gas chemical plant in the Surgil gas field near the Aral Sea that has been estimated to hold approximately 130 billion cubic meters of natural gas (96 million tons when converted to LNG and 830 million barrels when converted to crude oil). HPC holds 22.5% of shares and is participating as the representative of the Korean consortium. In addition, HPC entered an agreement with E1, a Korean energy company for the long-term supply of butane (LPG), built a propylene catalyst company in a joint venture with Mitsui of Japan. These are all part of HPC's efforts to secure a stable source of raw materials to enhance its production capacity.

## SECURING A STABLE PROCESS OPERATION CAPABILITY

The Daesan and Yeosu plants are setting never-before-seen records in terms of production scale, continued production time and accident-free man hours. The PRiME activity that was designed based on employees' suggestion for process improvement was introduced in 2005 to increase plant operation rate and enhance facility safety, while implementing the TPM (Total Productive Management) activity for facilities maintenance, improving working conditions and reducing costs. Daesan Plant has the largest ethylene production capacity in Korea at 1 million tons, and produced 1.08 million tons in 2010, recording over 1 million tons of ethylene production for 2 consecutive years. No other single plant has accomplished this record of 1 million tons of ethylene production for 2 consecutive years, and it is all the more appreciated because it was accomplished with zero accidents. As for Yeosu Plant, its ethylene factory achieved 2,000 days (5 years and 6 months) of non-stop operation since June 26, 2005.



# Win-win Cooperation

## Collecting partner companies' opinions

HPC's purchasing director visits 2 or more partner companies every quarter, listening to the difficulties they may be facing, and their opinions on HPC's win-win program. HPC holds the "Mutual Growth CEOs' Seminar" in order to discuss mutual growth with suppliers and ways to support them. The agency meeting is held twice a year to provide information on market conditions and product training.



Mutual Growth CEOs' Seminar



Mutual Growth Academy

## PARTNERSHIP WITH SUPPLIERS

HPC strives to provide equal opportunities to the 1,800 partner companies and bring mutual benefits through transparent transactions. The compliance clauses on labor regulations, environment and safety are included in the plant construction contract, and HPC does not abuse its superior position to make unfair demands or ask for money or treats. HPC also incorporates clauses for the protection of human rights in other contracts or when selecting suppliers and will expand this to other areas to fulfill its social responsibilities. Through regular meetings with partner companies HPC listens to the difficulties they are facing and their suggestions/requests, and provides economic, technical and manpower support, sharing the vision and goals and striving to become a horizontal partner.

## FAIRNESS IN SELECTING PARTNER COMPANIES

HPC has established an integrated electronic purchasing system, proving fair opportunities to those suppliers that meet the participation category, and the purchasing and payment is conducted in a transparent manner through the electronic purchasing system. HPC made a training manual for the Compliance Program for fair trade and distributed it to the partner companies, and plans to expand this to online training. In addition, HPC built a partner company evaluation system that incorporates human rights protection. Companies showing outstanding results at the regular evaluations are commended and those that score poorly are screened out, further enhancing fairness and transparency in the selection of partner companies.

## MANAGEMENT AND PRODUCTION SUPPORT

HPC's transaction with SMEs occupies 75% of total transactions. In order to help small and medium suppliers' financial difficulties, HPC built a mutual growth fund of KRW 25 billion, and is developing an indirect support program in collaboration with a financial institution. HPC abides by the principle of 100% cash payment within 10 days and in the case of long-term contracts HPC takes exchange rates and raw materials fluctuations into account in order to provide practical help to the suppliers. HPC also pledged to contribute KRW 36 billion to the Large companies-SMEs Mutual Growth Fund amounting to KRW 148.1 billion, which is a joint effort within the petrochemicals industry.

## SUPPORT FOR TECHNOLOGY IMPROVEMENT AND TRAINING

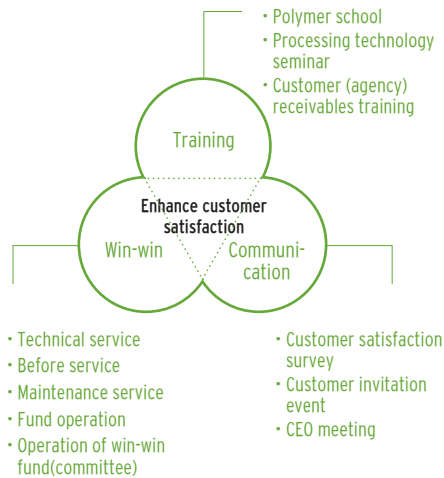
With a view to enhancing the competitiveness of partner companies, HPC selects companies that own patents and advanced technologies to support them in product development and conduct joint R&D for new product development and production technology, as well as providing product and process analysis support. In addition, HPC participates in problem solving and provides equipment support, and sends its process technology expert personnel to improve their productivity, provide them with related technologies and hold seminars. HPC also supports training for production technology and job skills, and through the Lotte Group Mutual Growth Academy, HPC operates education programs on policies, work skills and leadership, helping partner companies build a foundation for sustainable growth.

## SAFETY MANAGEMENT AT PARTNER COMPANIES

The partner companies safety meeting is held every month where participants share information on the safety & health status and the enactment/revisions of regulations. HPC operates a safety & health community to enhance communication. As part of its accident prevention activities, HPC conducts regular safety & health inspection jointly with the partner companies to find any areas needing improvement and joins in solving the problem together. Thanks to these efforts, HPC won the Ministry of Labor's Award in 2010 at the "Mother company-Partner company Partnership Model Case Presentation" hosted by KOSHA (Korea Occupational Safety & Health Agency).

# Customer Satisfaction

## Customer Satisfaction Strategy and Major Win-win Programs



## 2010 Customer Satisfaction Survey Results

Product quality	4.19
Product packaging	4.00
Product order	3.81
Product delivery	4.04
Sales operations	4.03
After sales management	3.67
Product pricing	2.84

(Unit: points/5 points)



2010 Polymer School

## IMPROVING CUSTOMER SATISFACTION

Most of HPC's customers are in cooperative relations. In order to enhance customer satisfaction, HPC established 3 strategies - product & technical training, communication with the customers, and win-win cooperation - and strives to foster a culture of win-win cooperation.

## CUSTOMER SATISFACTION SURVEY

In 2010, HPC conducted an online customer satisfaction survey to hear their real voices and guarantee anonymity. Customer satisfaction surveys are conducted annually on product quality, packaging, orders, delivery, sales operations, after sales management and price, and is used as a window of communication to understand customer needs and solve complaints. Customer complaints are immediately reflected in the improvement task and prevention measures are put in place, the results are reported monthly on Yeosu and Daesan products, continually reflecting customer requirements in HPC's management policies. The 2010 survey showed demands for improvement in notification of product pricing and price changes, and as there have been requests for more technical service and visitations, HPC has reflected them in its win-win cooperation policy.

## BEFORE SERVICE ACTIVITIES

HPC aims for continued satisfaction and trust from the customers through customer management services, devoting itself to zero customer complaints. In particular, HPC provides its technology through customer invitation and visitation programs, and it has been found that many customers benefited from this program in terms of improved productivity and quality.

## OPERATION OF THE POLYMER SCHOOL

Polymer School is a program targeting domestic PP and PE vending companies that introduces HPC's production status, quality management and customer support system and holds a Q&A session, enhancing customers' trust on the product. Every year, HPC invites customers to the research institute or plant according to their respective fields and conducts technical training, providing broad technical information on the product, which helps customers in quality control and new product development. In 2010, 26 individuals from 13 companies were invited to the 2010 Polymer School held at Yeosu Plant.

## PROTECTING CUSTOMER PRIVACY

HPC regards customer privacy to be of great importance and established a policy on the management of personal information, and operates a department for the protection of personal information. HPC takes precautionary measures to prevent the loss, theft, leak, falsification or damage to personal information and conducts employee training to heighten privacy awareness.

## ACTIVITIES TO RESPOND TO PL (PRODUCT LIABILITY)

HPC ensures product safety throughout all the stages from development to the final customer service. HPC established PL regulations and took up an insurance against product liability in order to prevent losses caused by product-related accidents and respond effectively to the PL-related demands from customers. Products for domestic distribution are labeled with warnings on the product container and packaging according to the Occupational Safety and Health Act and Toxic Chemicals Control Act. Export products are labeled according to the requirements provided by the country's laws to induce proper usage during transportation or handling.

# Through communication and cooperation, HPC will become Asia's most admired chemical company

## Community Leader

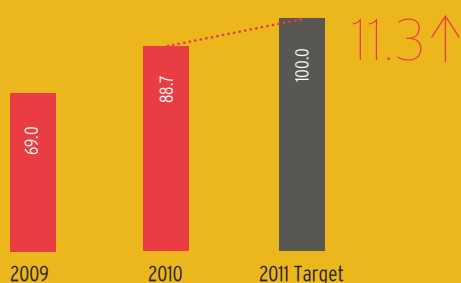
HPC is open to everyone. Past the borders between regions, stakeholders and employees everyone becomes "we."

HPC strives for community leadership through various channels in order to become the company that contributes to the local community, the company that puts employees first, and the company that partners want to work with. HPC's efforts to build a healthy society will continue through evaluation and compensation, human assets management, labor-management relations, RC (Responsible Care), and protecting nature.

## Priority Issues

Cultivating human resources, invigorating communication within the organization, social contribution activities

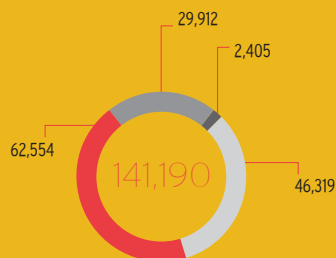
### Education & Training (Unit: hour/capita)



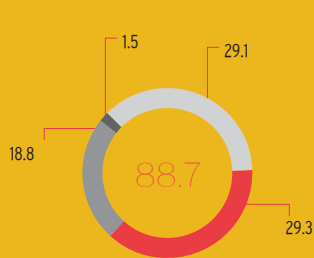
### Training hours (Unit: hours)

Level training General, Language training  
Job training Special training

#### TOTAL TRAINING MAN HOURS



#### TRAINING HOURS PER CAPITA



### SOCIAL CONTRIBUTION PERFORMANCE IN 2010

Cultivating future human assets was set as social contribution goal

#### Providing diverse education programs to cultivate future human assets

HPC actively participates in the "Chemical Frontier Festival" and "Open up! Fun World of Chemistry" in order to cultivate human talents in chemistry, and conducts cooperative education for university students each year. In addition, with a view to broadening the learning opportunity for the underprivileged groups, HPC supports the establishment of elementary schools in Southeast Asia and Africa, provides opportunities of learning by experience to the children in underprivileged groups in cooperation with the local children's center, and supports the operation of the children's study room. HPC also actively participates in cultivating local human assets through activities such as supporting the remodeling of the local school's library and contributing to the Yeosu Industrial Complex Scholarship Fund.

### LABOR-MANAGEMENT COOPERATION PERFORMANCE IN 2010

Fostering a labor-management culture of mutual trust and coexistence

#### Named Outstanding Social Responsibility Corporation and won Grand Prize at Korean Labor-Management Cooperation Awards

Labor and management maintains a peaceful and constructive relationship by guaranteeing the management rights of the company and labor rights of the labor union in an equal position. In 2010, HPC was selected as an Outstanding Social Responsibility Corporation by the Ministry of Labor and Employment in recognition for its efforts at creating jobs and improving the employment conditions. In 2011, HPC won the Grand Prize in the large companies sector at the Korean Labor-Management Cooperation Awards hosted by Korea Employers Federation in recognition for zero labor disputes and contributing to the win-win atmosphere between labor and management.







# What kind of products shall we make for the future generation?



HDPE

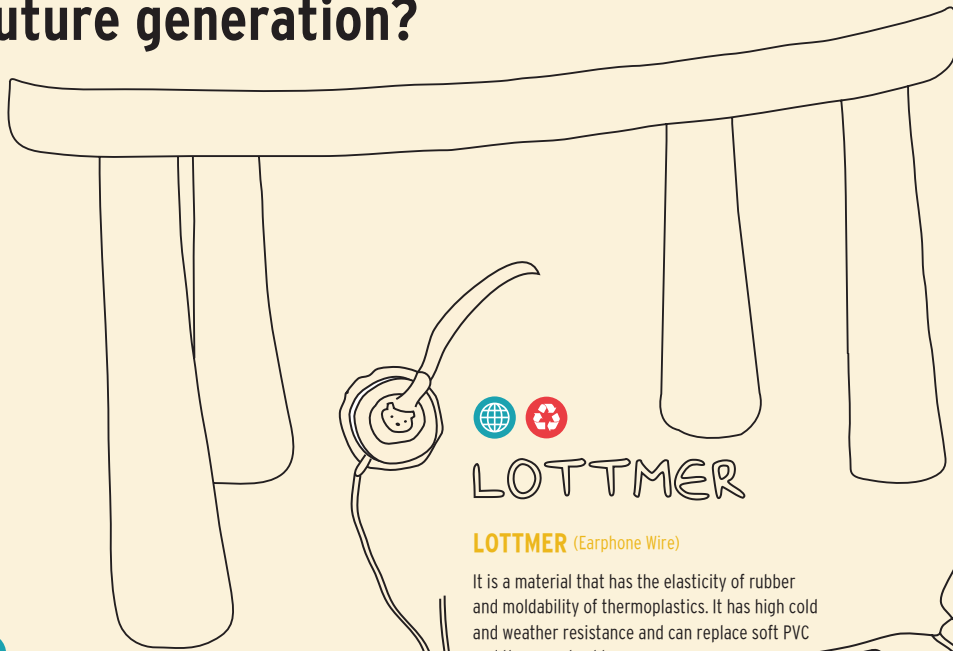
High-density polyethylene (Desk)



PC

Polycarbonate\_Hopelex

(Laptop Frame, CD)



LOTTMER

LOTTMER (Earphone Wire)

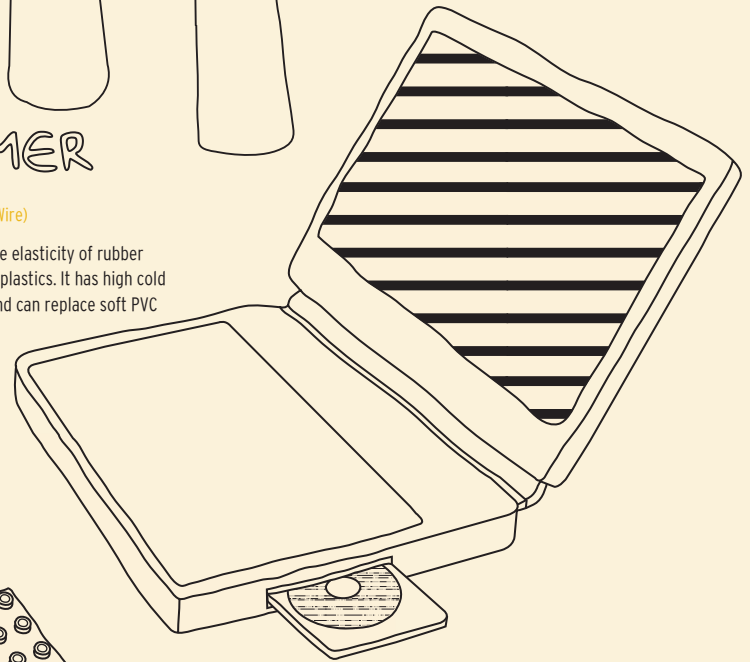
It is a material that has the elasticity of rubber and moldability of thermoplastics. It has high cold and weather resistance and can replace soft PVC and thermoset rubber.



MMA

Methyl Methacrylate (Monitor Film)

It is a colorless and transparent liquid that easily polymerizes with light, heat, radiation and peroxides to become methacrylate resin. HPC's MMA process is an eco-friendly process that produces MMA through direct oxidation and esterification of isobutylene extracted from C4 fraction instead of the conventional ACH method (that uses acetone cyanohydrin), which reduces waste generated during processing.



GHG EMISSION REDUCTION AT SM, MMA PROCESS



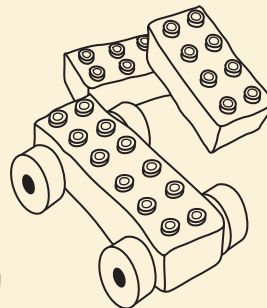
SM

123,189 tCO<sub>2</sub>-eq

BD

Butadiene (Sneaker Sole)

The BD(butadiene) plant uses mixed C4 produced at the ethylene plant to produce high value-added products. BD is the material for synthetic rubber for which demand is rising quickly as a replacement for rubber and due to the advancement of the automobile industry.



Styrene Monomer (Lego)

It is the material used for ABS resins and Styrofoam for construction/packaging, and is produced through the dehydrogenation reaction of the alkylbenzene that is made from the reaction between ethylene and benzene.



Prevention of Environmental pollution



Energy-saving



CO<sub>2</sub> Reduce



Recycling

At the SM factory where the raw material for children's toy blocks are made, the implementation of a multi-effect process technology that retrieves waste heat and innovative process improvements have brought the effect of reducing 110,000 tons of GHG emissions annually.

# A Good Company to Work for

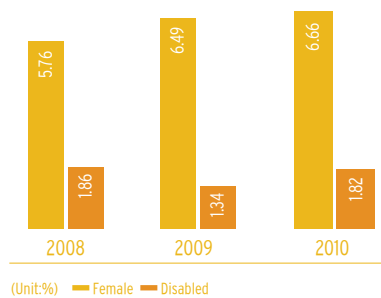
14.3 years

Average length of service

1,592 employees

Total number of employees

Ratio of female and disabled workers



## A GOOD COMPANY TO WORK FOR

HPC is fully aware of the role and importance of the employees in sustainability management. HPC values the diversity of its constituents and motivates them so that they may develop and realize their full potential based on performance orientation. HPC identified 4 tasks - strengthening core capabilities, enhancing employees' capabilities, establishing a global HR system, and improvement of organizational culture - in order to foster a corporate culture that builds good working environment.

## EMPLOYEE STATUS

According to section 3 of the Code of Ethics, HPC does not condone any kind of discrimination based on race, age or gender except performance, and observes the regulations of the Labor Standard Act and ILO against child labor and compulsory labor. As of December 31st 2010, 1,592 employees are working at the head office, research institute, Daesan and Yeosu plants. The ratio of female employees is 6.66% and is increasing every year, and HPC puts its efforts in employing more disabled persons. The number of regular workers is 1,499 and contract workers 58, and the average length of service is relatively high at 14.3 years. In 2010 HPC recruited 127 new employees through a fair and public procedure, of which 20 are females and 12 are from the local area. Same basic wages are paid within the same employee category regardless of gender, and a reasonable level of wages that exceed the legal minimum are paid, as well as overtime payment. The number of retirees in 2010 was 93, of which 14 were female (turnover rate 13.1%) and 79 were male (turnover rate 4.8%). HPC operates a retirement system for employees who have reached retirement age, allowing them 3 months' leave to prepare for retirement and provides a 4-day domestic tour package. This is a reflection of HPC's devotion to help retirees maintain their quality of life by providing an opportunity to prepare for the life after retirement.

## NUMBER OF EMPLOYEES BY REGION

(Unit: persons)

Region	Head office(Seoul)	Research Institute(Daeduk)	Yeosu Plant	Daesan Plant	Total
Male	303	112	635	436	1,486
Female	51	24	13	18	106
Total	354	136	648	454	1,592
Ratio of females	14.4%	17.6%	2.0%	4.0%	6.7%

## NUMBER OF EMPLOYEES BY EMPLOYMENT TYPE

(Unit: persons)

	Executives	Regular workers	Contract workers	Total
Male	35	1,434	17	1,486
Female	-	65	41	106
Total	35	1,499	58	1,592

## NUMBER OF EMPLOYEES BY AGE GROUP

(Unit: persons)

	20's	30's	40's	50's	Total
Male	173	445	672	196	1,486
Female	86	20	-	-	106
Total	259	465	672	196	1,592

# Evaluation and Compensation

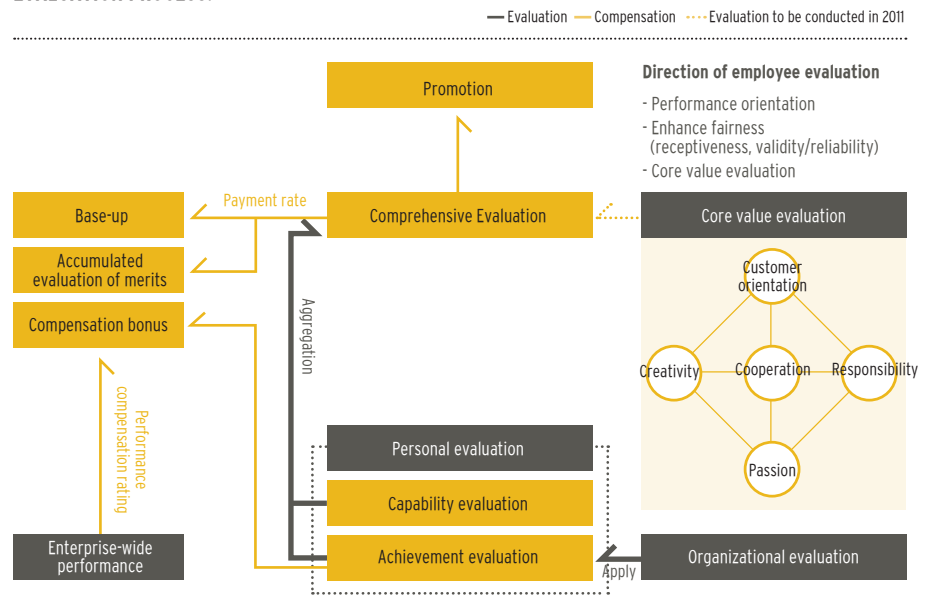
## HPC's Reward System

- Reward for model employee and outstanding team (sales/production/administration)
- Achievement award (for contributing to production maximization and energy conservation)
- For long-term service according to years of service
- Reward for individuals and teams who made outstanding suggestions
- Zero-accident incentive

## FAIR PERFORMANCE AND COMPENSATION

HPC introduced the fast track system as a principle for human resources management and compensation that does away with seniority and provides compensation based on employees' capabilities and performance in order to encourage employees to develop and realize their full potential. HPC's performance management system consists of organizational performance evaluation (KPI evaluation) and personal evaluation (MBO + capability), and the personal goal is set according to the organization's KPI (key performance index). At the beginning of the year all employees establish goals according to the MBO (management by objective) method and an evaluation and compensation for the performance on these objectives are conducted once or twice a year, upon which the promotion and performance compensation is decided and which enhances achievement and motivates the employees. The individual and team with outstanding performance are rewarded, and the group performance compensation is in operation which pays compensation according to management performance. HPC won the trust of the labor union based on its compensation process, and this is showing visible positive effects such as harmony between labor and management, and the "no labor dispute" announcement. This is a true virtuous circle that heightens the chance of success for new businesses, which in turn creates jobs and guarantees employment, resulting in stable mindset and motivation of employees and compensation opportunities rise.

## EVALUATION PROCESS.



## INNOVATIVE HUMAN RESOURCES MANAGEMENT

In tandem with the trend of the global market, HPC refurbished its organization and rank structure and introduced the job hosting system that provides an opportunity for the employees who have the ability and expertise to choose their own area of work, bringing new insight and work process improvement. Job hosting is an innovative human resources management system where the individual writes up a work process improvement report for the area he/she wants to work in, and evaluation is conducted on the report, then the individual is appointed to the post. In 2010, 2 individuals applied for job hosting and were appointed to their respective positions.

# Human Assets Management

## HPC's Ideal Human Talent

### Teamwork Based

A person who pursues mutual respect and cooperation

Creates synergy through cooperation and harmony based on trust

### Innovation

A person who pursues innovation through new line of thinking

Leads the future chemicals industry through new line of thinking and pioneering spirit

### Embracing Challenge

A person who pursues change and challenge

Pushes forward, undaunted by hardships. Creates future value aggressively and actively

## FOSTERING EMPLOYEES' CAPABILITIES

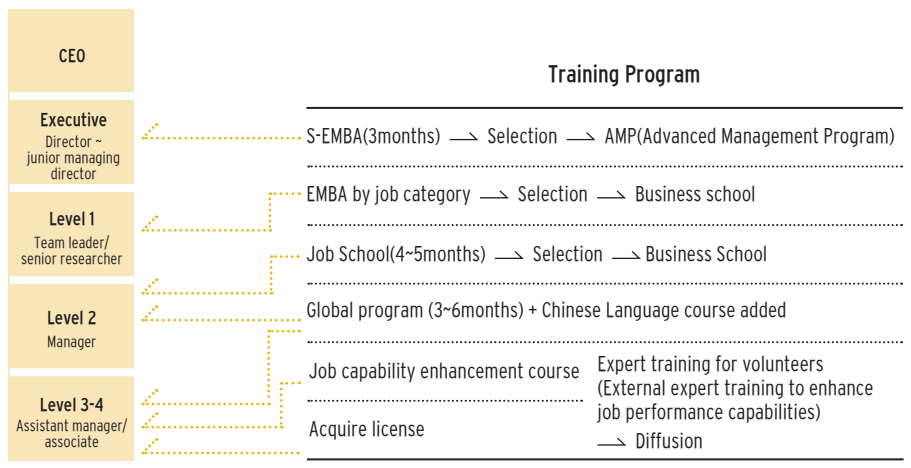
As HPC believes that the source of sustainable competitiveness comes from employees, it focuses on building a corporate culture that values creativity and liberty and cultivating human talents equipped with global competitiveness. HPC established a roadmap for human talent cultivation to learn expert knowledge required at the job and makes use of commissioned education by external expert organizations. Experts are cultivated through training programs in finance, tax, HR, labor, sales, receivables, logistics and production process and the knowledge acquired through these programs are shared at the departments, improving work efficiency and enhancing the company's competitiveness. In addition, over 360 online courses including, language, leadership, marketing, finance, accounting and data processing are conducted each month, while manager level employees receive level training according to their ranks, further enhancing employees' capabilities.

## CULTIVATING CORE HUMAN TALENTS

HPC provides a variety of training programs in order to cultivate core human talents. The School program by job post and MBA program is operated to cultivate human assets with high potential. At the HR School, Strategy School, Production Management School and Finance School, students learn the basic knowledge and recent trends in their respective fields to strengthen their job expertise.

For manager level employees, HPC operates the 4-month EMBA program inviting renowned professors as lecturers, and for the executive level, courses in general management (HR, finance, strategy, marketing, new business) and MBA program are provided to help them learn strategic thinking and internalize management know-how. As such, HPC fully supports and invests in core human assets.

## ROADMAP FOR CULTIVATING HUMAN TALENTS



## Cultivating Global Human Talents



## CULTIVATING GLOBAL HUMAN TALENTS

HPC cultivates human talents with a global mind and competitiveness to open new overseas markets and for smooth overseas operations. The problem of a shortage of global manpower is solved through programs such as Global Asset Cultivation Program (language) and Global Asset Overseas Training Program, and the 1 to 1 coaching program with native speakers helps enhance practical foreign language skills.

# Labor-Management Relations

## LABOR UNION STATUS

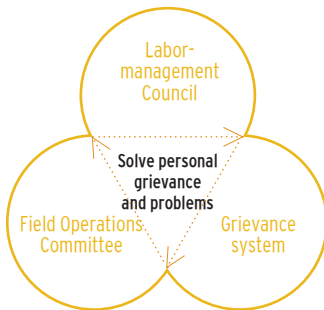
HPC upholds the 3 labor rights of freedom of association, right to collective bargaining and right to collective action and always discusses important decisions and changes with the union. HPC has separate union at Yeosu Plant and Daesan Plant and maintains a peaceful and constructive relationship by guaranteeing the management rights of the company and labor rights of the labor union in an equal position. In 2010, HPC was selected as an Outstanding Social Responsibility Corporation by the Ministry of Labor and Employment in recognition for its efforts at creating jobs and improving the employment conditions. In February 2011, HPC won the Grand Prize in the large companies sector at the Korean Labor-Management Cooperation Awards hosted by Korea Employers Federation in recognition for zero labor disputes and contributing to the win-win atmosphere between labor and management.

## LABOR UNION MEMBERSHIP STATUS

(Unit: persons)

	Established date	Persons eligible for membership	Union members	Union member ratio
Yeosu Plant	1980.5	536	492	92%
Daesan Plant	1995.4	313	294	94%

## Labor-management Communication Program



## GRIEVANCE PROCEDURE

HPC operates preventive grievance procedure and also one that is completed at the field, listening to the employees' complaints and taking immediate measures to improve employee satisfaction. The grievance procedure includes all the aspects of work such as human rights, anti-corruption, anti-discrimination and work process improvement. The ethical management education and complaints board makes the grievance procedure all the more efficient. In 2010 anti-sexual harassment education was conducted on all employees and there have been no cases of complaints officially received having to do with human rights or discrimination.

## SHARING THE VISION

The intranet is a medium of sharing organizational information and where active communication takes place. The shared knowledge and suggestions are rewarded through "knowledge points" or "suggestions mileage" which helps foster active communication. A vision internalizing program is under way that motivates employees to actively pursue company's visions and helps form a consensus within the organization.

## LABOR-MANAGEMENT ACTIVITIES IN 2010

Name of activity	Period	Details
Communication plaza	All year round	Innovate communication between management level and employees
Field meetings	Twice/month	Listen to the grievance of employees at the field and present solutions
Labor-management workshop	March, October	Share Lotte Group's core visions and search for future development direction by checking on current status
Management briefing	January, September	Share company's current business status
Field operation committee by leader	Quarterly	Heart-to-heart talks led by team leaders.
Face to face between field manager and employee	At least twice a month	The team and section leaders have face to face communication with employees to listen to employees grievance twice a month
Labor-management field meeting	At least once a month	Listen to suggestions/grievances and the measures taken in a unit of 4 ~ 6 persons by team or rank in an outside location, and relay the measures taken

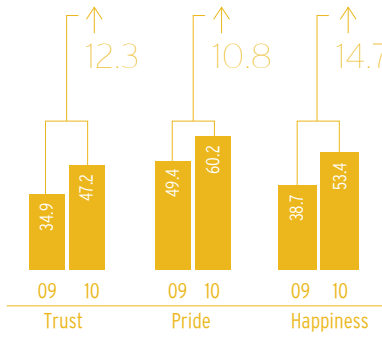
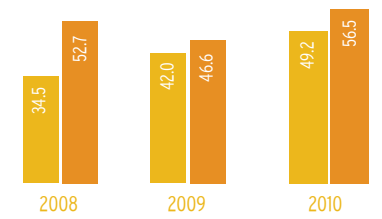
# Welfare

## GWP Satisfaction Survey Results

(Unit: points)

### Group and HPC's average

■ Group average  
■ HPC average



Matchmaking event, "We are a couple now"

## EMPLOYEE SATISFACTION SURVEY

In order to build a workplace atmosphere that is trusting, proud of the work and enjoyable, HPC conducts an employee satisfaction survey (GWP, great workplace) each year. HPC monitors the organizational culture through the survey and sets the HR direction based on the survey results. The overall GWP score announced in June 2011 shows that HPC scored 56.5 points which is relatively higher compared to Lotte Group's average, and the pride sector scored highest.

## WELFARE PACKAGE

HPC offers various benefits programs to enhance employees' quality of life such as tuition support for children, company housing, support for family events (such as weddings or funerals) and vacation expenses, vacation and reward for long-term service, club activities, housing funds, resort membership and medical expenses. HPC operates a selective welfare package that employees can choose from according to their needs. In addition, HPC has taken up retirement pension, national pension plan, health insurance, unemployment insurance and occupational health and safety insurance in view of employees' retirement, aging, injury or death.

## FAMILY FRIENDLY MANAGEMENT

HPC provides benefits that the employees' family can enjoy. At Yeosu and Daesan Plants, 1,384 company houses are available, and a swimming pool, gym and various other facilities are in operation so that employees may enjoy healthy leisure time with their families. HPC contributes PCs to the school where employee's children are attending and holds various events such as education camp with Dad, various education support, factory tours, and trip to baseball games.

As part of the campaign to build a good workplace, HPC participated in a matchmaking event held in collaboration with other corporations titled "We are a couple now" in September and December. In addition, in response to the government's policy encouraging childbirth HPC guarantees 90 days of prenatal and maternity leave, encourages employees with children under the age of 6 to take parental leave of up to 1 year, divided parental leave, and spouse childbirth leave. Employees returning from parental leave are appointed to positions that pay the same level of wages before taking the leave to help them quickly readjust to work, prohibits firing employees during parental leave and includes the leave period in calculating the service time so that there is no unfair treatment in promotion or retirement. These policies are stated in the rules of employment and the application provisions of the collective agreement, and 100% of the employees wanting reinstatement returned to work. In addition, as a means of helping solve the national problem of low birth rate due to parenting burden. HPC supports the total amount of admission fee and tuition for children in middle school, high school or college.

## IMPROVING EMPLOYEES' HEALTH

All employees can get health counseling and medical service at the health management center open at all HPC business sites. HPC provides personal checkup service and keeps track of health records to help build a healthy workplace. The smoking area permit system was introduced in all the plants and a non-smoking campaign is under way. Every three years a survey is conducted to identify detrimental factors to the musculoskeletal system and the working environment is improved to prevent musculoskeletal system disorders. All employees receive regular checkups, special checkups and external general checkups to prevent occupational as well as general diseases. HPC provides medical checkup support not only for the employees but also for their spouses every other year.



# RC

## RC (RESPONSIBLE CARE)

RC is the whole of voluntary management activities of a corporation striving to fulfill its social responsibility, and greatly contributes to enhancing internal environment, safety and health related activities. HPC built a self-evaluation system where employees can evaluate whether the 6 RC codes (employee safety & health, process safety, anti-pollution, local community's perception and emergency response and, distribution, and whole process responsibility) are being implemented efficiently and continues its efforts to foster RC. 2010 surveys show that Yeosu Plant's overall level went up compared to the previous year. Daesan Plant introduced the whole process responsibility code and distribution code, establishing an integrated RC operation system alongside Yeosu Plant.

### RC SELF-EVALUATION RESULTS

(Unit: points/6 points)

Yeosu Plant				Daesan Plant		
2008	2009	2010	RC self-evaluation	2008	2009	2010
4.77	4.76	4.79	Process safety	5.1	4.8	4.8
4.74	4.75	4.76	Employee safety & health	5.2	4.9	4.9
4.64	4.67	4.70	Anti-pollution	4.9	5.1	5.2
4.68	4.74	4.70	Local community perception and emergency response	3.2	4.9	4.2
4.63	4.63	4.72	Distribution	-	-	1.9
4.61	4.66	4.71	Whole process responsibility	-	-	3.1

## PREVENTING INDUSTRIAL ACCIDENTS

HPC quantifies the safety & health performance and promotes safety awareness to prevent industrial accidents. Regular online safety training is conducted using the RC & EHS System, and all HPC employees can log on to the system to use the uploaded training material. Apart from the regular safety training, firefighting squad exercises and basic firefighting exercises for all employees are conducted so that everyone may take part as a voluntary firefighter in case a real fire occurs, and joint exercises are conducted every year with the fire station in the area to ensure quick mutual assistance. Through the inspection for secondary accidents and potential dangers using the EHS System (Environment Health and Safety System) in 2010, 7,389 cases were identified at Yeosu Plant which approximates 12 cases per capita, and 90.4% or 6,682 cases have been improved. Daesan Plant identified 6,868 cases (14.7 cases per capita) and took measures for 99% of the cases.

## ZERO-ACCIDENT BUSINESS SITE

Yeosu Plant accomplished 11.46 million accident-free man hours for 2,645 days from October 2003 to December 2010 (7 years 3 months), and Daesan Plant accomplished 5.78 million accident-free man hours for 1,900 days from October 2005 to December 2010 (5 years 3 months), which makes HPC equal to none in maintaining a zero-accident operation site. Every year, HPC's accident rate is zero, which is one of the objective criteria in determining HPC's activities to prevent industrial accidents and its accomplishments. HPC has recorded zero for the past five years in injury rate, occupational disease occurrence rate and absence which are important factors for the morale and productivity of the employees.

# 0%

## Accident rate

### INCIDENT RATE

		2008	2009	2010
Total of the domestic industrial sector	Number of employees	13,489,986	13,884,927	14,198,748
	Number of injured employees	95,806	97,821	98,645
	Accident rate (%)	0.71	0.07	0.69
Chemicals industry	Number of employees	287,906	291,822	292,098
	Number of injured employees	2,911	2,925	2,900
	Accident rate (%)	1.01	1.00	0.99
HPC	Number of employees	1,191	1,143	1,118
	Number of injured employees	0	0	0
	Accident rate (%)	0	0	0
	Injuries (persons)	0	0	0
	Occupational diseases (persons)	0	0	0

\*HPC's workers only includes employees working at Yeosu and Daesan Plants

### Safety Management Organization Structure



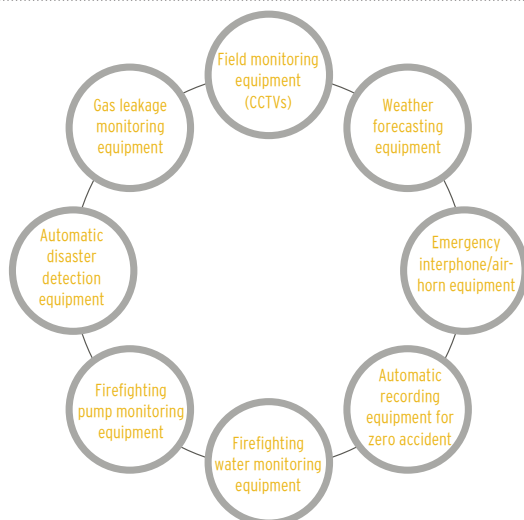
### SAFETY & HEALTH MANAGEMENT

HPC pursues zero-accident operation based on the CEO's strong determination for safety & health management and safety policy. HPC has established and operates safety & health management systems including the PSM (Process Safety Management) and OHSAS/KOSHA 18001 at all the processes, and operates safety management departments composed of safety experts at each operation site to tackle potential environmental risks and responses. In addition, the Industrial Safety & Health Committee comprised of the same number of representatives from and labor and management is in place, which holds quarterly meetings to collect field workers' suggestions and take appropriate measures, fostering a voluntary safety management culture.

### SAFETY INSPECTION ACTIVITIES

Employees patrol their working area regularly so that quick action may be taken even for the slightest change, and safety experts conduct regular inspections to identify and remedy inadequate elements at the hazardous materials storage facility and firefighting facilities. The safety inspection team visits the field once a week to take corrective measures and supervises the employees to share the information with other departments. HPC operates an integrated disaster prevention system in order to reform worn-out and dispersed anti-disaster facilities and secure efficiency, flexibility and reliability of its safety management activities.

### 종합 방재 시스템



# Contributing to the local community

## Mid-to-long-term Social Contribution Strategy

### 1 Phase (2007~2008) : Introductory Period

#### PREPARATIONS

- Personal prior survey
- Forming a bond
- Introduction of the matching grant system



### 2 Phase (2009~10) : Growth Period

#### IMPLEMENT ACTIVITIES

- Launching of the Social Volunteer Group, the employees' voluntary organization
- Systematic volunteerism such as supporting underprivileged groups and environment preservation
- Development and implementation of HPC's unique programs



### 3 Phase (2011~) : Stabilization Period

#### EXPANSION AND IMPROVEMENT OF ACTIVITIES

- Befitting its status as a global corporation, expand volunteerism to underdeveloped overseas regions
- Stabilization and expansion of HPC's unique program

## SOCIAL CONTRIBUTION STRATEGY

HPC strives to contribute to building a happy and prosperous society through social contribution activities. HPC operates a Social Contribution Advisory Committee and support organizations at each business site for a stronger and systematic approach to social contribution activities, and undertakes strategic and systematic sharing activities based on a mid-to-long-term roadmap so that HPC's social contribution can contribute to society's sustainable growth. When selecting beneficiaries HPC receives recommendation from related institutes and local social workers and finalizes the decision after verifying the actual situation to ensure that its act of sharing is transparent and effective.

## BONDING WITH THE COMMUNITY

With a view to forming a bond as a citizen of the local community HPC is expanding interaction with the community through various events and sharing activities, and there has been no violation of local residents' rights that occurred in 2010. As HPC's business site is located within the industrial complex, its business operations do not have great impact on the local residents or ecosystem. Nonetheless, HPC opens the swimming pool in the company housing in Yeosu and Daesan and strives to build a healthy community through various projects such as living quarters improvement projects, medical support and fumigation for the rural villages with sisterhood ties with HPC. In addition, HPC often exchanges ideas with the local representatives and welfare organizations to strengthen local ties and pays for domestic tours for seniors during the Family Month (May) and sends gifts on Chuseok (Thanksgiving) and Seol (Lunar new year) holidays.

## MATCHING GRANT AND USURI SYSTEM

HPC introduced the matching grant and Usuri systems as part of its mid-to-long-term social contribution strategy, promotes a culture of donation throughout society and encourages participation of all HPC constituents from the CEO to employees. In particular, the matching grant system where the company gives back the same amount an employee has donated, and the Usuri system which deposits amounts

## 2010 HPC Volunteer Works

1358 employees

Participated as volunteers



7 times consecutively

2010 Chemical Frontier Festival



below a certain level from the employees' paychecks are HPC's social contribution program that all the members gladly participate in. In 2010, KRW 53 million including the CEO's special contribution of KRW 10 million was donated to the society.

### CULTIVATING HUMAN TALENTS OF THE FUTURE

HPC selected cultivation of future human talents as its strategic social contribution goal and continues to support talented individuals in chemistry as well as local human talents. One of the representative activities in cultivating human assets in chemistry is the "Chemistry Frontier Festival" that HPC has been participating in for the past 7 years in collaboration with the chemistry industry. HPC also participates in the "Open up! Fun World of Chemistry" hosted by the Korea Responsible Care Council, and conducts cooperative education for university students each year. In 2010 HPC held a chemical engineering leadership education program for 60 students from Yonsei University, Department of Chemical and Biomolecular Engineering and introduced them to how chemistry works at the field. On the other hand, HPC also supports local talents and some of the projects undertaken to this end include building elementary schools in Southeast Asia and Africa, supporting children's study room at the welfare facilities and remodeling of local elementary school library, and provides opportunity for cultural and learning experience to children from underprivileged groups in cooperation with local children's center. In addition, HPC contributed KRW 890 million to the Yeosu industrial complex scholarship fund.

### VOLUNTEER ACTIVITIES

At HPC, 14 volunteer groups comprised of 600 employees and their families in each region practice volunteerism in social welfare, scholarship and environment & culture. Yeosu Plant's "Sharing Love and Happiness," "Together Volunteer Group," and Daesan Plant's "Hope Volunteer Society" and "Morn-

ing Star Volunteer Society" provide economic support to local seniors living alone, welfare facilities for the disabled, children of low-income families and children from multicultural families. They also pay regular visits to provide household necessities, kimchi and briquettes. The volunteer groups undertake more than 34 volunteer activities annually. At the company level, HPC maintains sisterhood ties with rural and fishing villages and provides them practical support such as purchasing local products and contributing to the local development fund. In July 2011, Daesan Plant's Hope Volunteer Society won the grand prize at the 18th National Volunteer Festival where 1,235 teams participated. The Hope Volunteer Society was founded in 1993 with the employees' voluntary participation and practices sharing through various volunteer activities such as home improvement for the underprivileged and donating household items to seniors living alone. With the goal of expanding the culture of sharing and participation, the Seoul head office held the launching ceremony for the "Hobongi Volunteer Group" in April 2010. Hobongi Volunteer Group pays regular visits to the childcare center in Shillim-dong, and in November, donated briquettes to the residents of Garibong-dong in collaboration with the Nambu Welfare Center for the Disabled located within Boramae Park.

### ENVIRONMENTAL CLEANUP ACTIVITIES

With a view to reducing pollution and restoring a clean environment, HPC conducts environmental cleanup activities in areas frequented by local residents such as historical sites, the sea, and the environment surrounding the HPC's plants. In addition to the weekly cleanup around the factory, HPC undertook 33 cleanup activities in 2010, covering areas such protecting the ecosystem near Museon Mountain, Daesan Myeongji Reservoir and Mangil Mountain, and coastal cleanup activities at Soho Yacht Racing Course and Samgilpo Port.



11.4 hours  
Average participation time per capita



KRW 4.3 billion  
Total contribution to local community



15,480 hours  
In volunteer activities



# GRI G3.1 Index

● Disclosed ● Partially disclosed ✕ Not disclosed N/A Not Available

● Priority issue

Profile disclosure	Description	Page	Application level	Notes
<b>STRATEGY AND ANALYSIS</b>				
1.1	Statement from the most senior decision-maker of the organization.	2-3	●	
1.2	Description of key impacts, risks, and opportunities.	2-3	●	
<b>ORGANIZATIONAL PROFILE</b>				
2.1	Name of the organization.	13	●	
2.2	Primary brands, products, and/or services.	13	●	
2.3	Operational structure of the organization, including main divisions, operating companies, subsidiaries, and joint ventures.	4-5, 13	●	
2.4	Location of organization's headquarters.	13	●	
2.5	Number of countries where the organization operates, and names of countries with either major operations or that are specifically relevant to the sustainability issues covered in the report.	Cover, 5	●	
2.6	Nature of ownership and legal form.	5	●	
2.7	Markets served (including geographic breakdown, sectors served, and types of customers/beneficiaries).	4-5	●	
2.8	Scale of the reporting organization.	13	●	
2.9	Significant changes during the reporting period regarding size, structure, or ownership.	No change to reporting scope	●	
2.10	Awards received in the reporting period.	Appendix	●	
<b>REPORT PARAMETERS</b>				
<b>Report profile</b>				
3.1	Reporting period (e.g., fiscal/calendar year) for information provided.	Cover	●	
3.2	Date of most recent previous report (if any).	Cover	●	
3.3	Reporting cycle (annual, biennial, etc.)	Cover	●	
3.4	Contact point for questions regarding the report or its contents.	Cover	●	
<b>Report scope and boundary</b>				
3.5	Process for defining report content.	Cover	●	
3.6	Boundary of the report (e.g., countries, divisions, subsidiaries, leased facilities, joint ventures, suppliers). See GRI Boundary Protocol for further guidance.	Cover	●	
3.7	State any specific limitations on the scope or boundary of the report (see completeness principle for explanation of scope).	Cover	●	
3.8	Basis for reporting on joint ventures, subsidiaries, leased facilities, outsourced operations, and other entities that can significantly affect comparability from period to period and/or between organizations.	Cover	●	
3.9	Data measurement techniques and the bases of calculations, including assumptions and techniques underlying estimations applied to the compilation of the Indicators and other information in the report. Explain any decisions not to apply, or to substantially diverge from, the GRI Indicator Protocols.	Cover	●	
3.10	Explanation of the effect of any re-statements of information provided in earlier reports, and the reasons for for such re-statement (e.g., mergers/acquisitions, change of base years/periods, nature of business, measurement methods).	Cover	●	
3.11	Significant changes from previous reporting periods in the scope, boundary, or measurement methods applied in the report.	Cover	●	
<b>GRI content index</b>				
3.12	Table identifying the location of the Standard Disclosures in the report.	Appendix	●	
<b>Assurance</b>				
3.13	Policy and current practice with regard to seeking external assurance for the report.	Appendix	●	
<b>GOVERNANCE, COMMITMENTS, AND ENGAGEMENT</b>				
<b>Report profile</b>				
4.1	Governance structure of the organization, including committees under the highest governance body responsible for specific tasks, such as setting strategy or organizational oversight.	18	●	
4.2	Indicate whether the Chair of the highest governance body is also an executive officer.	18	●	
4.3	For organizations that have a unitary board structure, state the number and gender of members of the highest governance body that are independent and/or non-executive members.	18	●	
4.4	Mechanisms for shareholders and employees to provide recommendations or direction to the highest governance body.	18	●	

Profile disclosure	Description	Page	Application level	Notes
4.5	Linkage between compensation for members of the highest governance body, senior managers, and executives (including departure arrangements), and the organization's performance (including social and environmental performance).	18	●	
4.6	Processes in place for the highest governance body to ensure conflicts of interest are avoided.	18	●	
4.7	Process for determining the composition, qualifications, and expertise of the members of the highest governance body and its committees, including any consideration of gender and other indicators of diversity.	16	●	
4.8	Internally developed statements of mission or values, codes of conduct, and principles relevant to economic, environmental, and social performance and the status of their implementation.	14,appendix	●	
4.9	Procedures of the highest governance body for overseeing the organization's identification and management of economic, environmental, and social performance, including relevant risks and opportunities, and adherence or compliance with internationally agreed standards, codes of conduct, and principles.	18	●	
4.10	Processes for evaluating the highest governance body's own performance, particularly with respect to economic, environmental, and social performance.	18	●	Conducted by Audit Committee
<b>Commitments to external initiatives</b>				
4.11	Explanation of whether and how the precautionary approach or principle is addressed by the organization.	15	●	
4.12	Externally developed economic, environmental, and social charters, principles, or other initiatives to which the organization subscribes or endorses.	Appendix	●	
4.13	Memberships in associations (such as industry associations) and/or national/international advocacy organizations in which the organization: * Has positions in governance bodies; * Participates in projects or committees; * Provides substantive funding beyond routine membership dues; or * Views membership as strategic.	Appendix	●	
<b>Stakeholder engagement</b>				
4.14	List of stakeholder groups engaged by the organization.	8	●	
4.15	Basis for identification and selection of stakeholders with whom to engage.	8	●	
4.16	Approaches to stakeholder engagement, including frequency of engagement by type and by stakeholder group.	8	●	
4.17	Key topics and concerns that have been raised through stakeholder engagement, and how the organization has responded to those key topics and concerns, including through its reporting.	Cover, 8-9	●	
<b>ECONOMIC APPROACH AND PERFORMANCE INDICATOR</b>				
<b>Economic performance indicator</b>				
-	Disclosure on management approach	14	●	
EC1	Direct economic value generated and distributed, including revenues, operating costs, employee compensation, donations and other community investments, retained earnings, and payments to capital providers and governments.	16	●	
EC2	Financial implications and other risks and opportunities for the organization's activities due to climate change.	26	●	
EC3	Coverage of the organization's defined benefit plan obligations.	51	●	
EC4	Significant financial assistance received from government.	N/A	N/A	
EC5	Range of ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation.	47	●	
EC6	Policy, practices, and proportion of spending on locally-based suppliers at significant locations of operation.	-	●	HPC purchases expendables, maintenance and construction materials locally in order to contribute to the local community.
EC7	Procedures for local hiring and proportion of senior management hired from the local community at significant locations of operation.	47	●	
EC8	Development and impact of infrastructure investments and services provided primarily for public benefit through commercial, in-kind, or pro bono engagement.	54-55	●	
EC9	Understanding and describing significant indirect economic impacts, including the extent of impacts.	32	●	
<b>Environmental Performance Indicator</b>				
-	Disclosure on management approach	23	●	
EN1	Materials used by weight or volume.	28	●	
EN2	Percentage of materials used that are recycled input materials.	28	●	
EN3	Direct energy consumption by primary energy source.	27	●	
EN4	Indirect energy consumption by primary source.	27	●	
EN5	Energy saved due to conservation and efficiency improvements.	27	●	
EN6	Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives.	27	●	
EN7	Initiatives to reduce indirect energy consumption and reductions achieved.	27	●	
EN8	Total water withdrawal by source.	28	●	
EN9	Water sources significantly affected by withdrawal of water.	28	●	



Profile disclosure	Description	Page	Application level	Notes
EN10	Percentage and total volume of water recycled and reused.	28	●	
EN11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.	29	●	
EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.	29	●	
EN13	Habitats protected or restored.	29,55	●	
EN14	Strategies, current actions, and future plans for managing impacts on biodiversity.	29,55	●	
EN15	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.	No species affected	N/A	
EN16	Total direct and indirect greenhouse gas emissions by weight.	27	●	
EN17	Other relevant indirect greenhouse gas emissions by weight.	No other indirect greenhouse gas emissions	N/A	
EN18	Initiatives to reduce greenhouse gas emissions and reductions achieved.	27	●	
EN19	Emissions of ozone-depleting substances by weight.	29	●	
EN20	NOx, SOx, and other significant air emissions by type and weight.	29	●	
EN21	Total water discharge by quality and destination.	30	●	
EN22	Total weight of waste by type and disposal method.	30	●	
EN23	Total number and volume of significant spills.	29	●	
EN24	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally.	N/A	N/A	There are no such materials and all wastes are appropriately treated domestically
EN25	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.	30	●	
EN26	Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.	12, 22, 34, 46	●	
EN27	Percentage of products sold and their packaging materials that are reclaimed by category.	25	◉	Products sold are used as raw material at customers' relevant process. Although some are reclaimed it is difficult to quantify the amount
EN28	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.	28	●	
EN29	Significant environmental impacts of transporting products and other goods and materials used for the and transporting members of the workforce.	27	●	
EN30	Total environmental protection expenditures and investments by type.	25	●	
<b>Social: Labor Practices and Decent Work (Social)</b>				
-	Disclosure on management approach	47		
LA1	Total workforce by employment type, employment contract, and region, broken down by gender.	47	●	
LA2	Total number and rate of new employee hires and employee turnover by age group, gender, and region.	47	●	
LA3	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by major operations.	51	●	
LA4	Percentage of employees covered by collective bargaining agreements.	50	●	
LA5	Minimum notice period(s) regarding significant operational changes, including whether it is specified in collective agreements.	50	●	Significant changes are discussed with the labor union
LA6	Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs.	53	●	
LA7	Rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities by region and by gender.	53	●	
LA8	Education, training, counseling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases.	51, 52, 53, 54	●	
LA9	Health and safety topics covered in formal agreements with trade unions.	53	●	
LA10	Average hours of training per year per employee by gender, and by employee category.	44	●	
LA11	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings.	47	●	
LA12	Percentage of employees receiving regular performance and career development reviews, by gender.	48	●	100% of employees receive performance reviews regardless of gender
LA13	Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity.	18,47	●	
LA14	Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity.	47	●	

Profile disclosure	Description	Page	Application level	Notes
LA15	Return to work and retention rates after parental leave, by gender.	51	●	
<b>Human Rights Performance Indicator (social)</b>				
-	Disclosure on management approach	47	●	
HR1	Percentage and total number of significant investment agreements and contracts that include clauses incorporating human rights concerns, or that have undergone human rights screening.	42	●	
HR2	Percentage of significant suppliers, contractors and other business partners that have undergone human rights screening, and actions taken.	42	●	
HR3	Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained.	17, 50	●	
HR4	Total number of incidents of discrimination and corrective actions taken.	19, 50	●	
HR5	Operations and significant suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and actions taken to support these rights.	50	●	
HR6	Operations and significant suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the effective abolition of child labor.	47	●	
HR7	Operations and significant suppliers identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of all forms of forced or compulsory labor.	47	●	
HR8	Percentage of security personnel trained in the organization's policies or procedures concerning aspects of human rights that are relevant to operations.	17	●	
HR9	Total number of incidents of violations involving rights of indigenous people and actions taken.	54	●	
HR10	Percentage and total number of operations that have been subject to human rights reviews and/or impact assessments.	17, 19, 50	●	
HR11	Number of grievances related to human rights filed, addressed and resolved through formal grievance mechanisms.	50	●	
<b>Social: Society Performance Indicator (social)</b>				
-	Disclosure on management approach	54	●	
S01	Percentage of operations with implemented local community engagement, impact assessments, and development programs.	54	●	
S02	Percentage and total number of business units analyzed for risks related to corruption.	17	●	
S03	Percentage of employees trained in organization's anti-corruption policies and procedures.	17	●	Education conducted on all employees
S04	Actions taken in response to incidents of corruption.	17, 19	●	
S05	Public policy positions and participation in public policy development and lobbying.	27, 51, appendix	●	
S06	Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country.	-	●	No contributions are made to political parties or politicians
S07	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes.	No occurrence within reporting period	●	
S08	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations.	No occurrence within reporting period	●	
S09	Operations with significant potential or actual negative impacts on local communities.	54	●	
S010	Prevention and mitigation measures implemented in operations with significant potential or actual negative impacts on local communities.	54	●	
<b>Social: Product Responsibility Performance Indicator (social)</b>				
-	Disclosure on management approach	43	●	
PR1	Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and services categories subject to such procedures.	31	●	
PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning health and safety impacts of products and services during their life cycle, by type of outcomes.	No occurrence within reporting period	●	
PR3	Type of product and service information required by procedures, and percentage of significant products and services subject to such information requirements.	43	●	
PR4	Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes.	No occurrence within reporting period	●	
PR5	Practices related to customer satisfaction, including results of surveys measuring customer satisfaction.	43	●	
PR6	Programs for adherence to laws, standards, and voluntary codes related to marketing communications, including advertising, promotion, and sponsorship.	17, 43	●	
PR7	Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship by type of outcomes.	No occurrence within reporting period	●	
PR8	Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data.	43	●	
PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services.	No occurrence within reporting period	●	

# Honam Petrochemical Corp. Verification of Sustainability Management Report 2010

## INTRODUCTION

The Korea Foundation for Quality was asked to verify the 2010 Sustainability Report ("Report"). HPC is solely responsible for decisions regarding reporting standards and the Korea Foundation for Quality takes charge of providing verifying opinions on the Report.

The GRI (Global Reporting Initiative) "2011 Sustainability Reporting Guidelines (G3.1)" that is widely accepted was applied in this Report.

## INDEPENDENCE OF VERIFICATION

KFQ has no conflict of interest with HPC in terms of profit generation-related activities except providing their party verification service for the Report. Nor do we have any biases regarding HPC's stakeholders.

## CRITERIA OF VERIFICATION

KFQ has conducted verification in accordance with the AA 1000 Assurance Standard published by AccountAbility in 2003. The standard operates under the principles of Materiality, Completeness and Responsiveness, and the Report was assessed under these principles.

The verification scope includes sustainability activities and performance of HPC head office, Daeduk Research Institute, Yeosu Plant and Daesan Plant.

## VERIFICATION PROCEDURE

The verification procedure has been planned to achieve reasonable assurance whether there exists any material error or misrepresentation in the Report. Also KFQ has verified the credibility of the Report's contents and the effectiveness of the internal process systems for preparing the Report according to the following steps.

- **Desk Review** | We have performed an analysis on HPC's sustainability perspective data by comparing the contents described in the Report against information acquired through the internet and media surveys. Financial information in the report has been crosschecked with the audited "2010 Financial Statement of HPC".
- **On-site Assessment** | On-site assessment has been conducted at the head office, Daeduk Research Center, Yeosu Plant and Daesan Plant to evaluate the accuracy of the information presented in the Report and the efficacy of the information management system or the reporting process. Based on the sampling principle after due consideration of the information materiality, we have gathered evidence on the sustainability activities and performance disclosed in the Report through examination of internal documents and interviews with the personnel in charge of information handling, and conducted a survey and analysis on the information management system and the reporting process.

- **Resolution of Findings** | The errors, inappropriate information or misrepresentations were duly corrected which KFQ has confirmed in the final Report. KFQ conducted another GAP analysis on the final Report against the GRI guidelines.

## CONSIDERATIONS AND LIMITATIONS

The accuracy and completeness of the performance data disclosed in the Report has its inherent limitations depending on the method of determination, calculation and assumption of the characteristics and numbers of the relevant data.

## CONCLUSIONS

Based on our review, KFQ has obtained reasonable basis to conclude as follows:

1. The application level of the "2011 Sustainability Reporting Guideline (G3.1)" in the Report was evaluated as A+.
2. HPC has in place processes to identify and understand the activities, performance, concerns and issues brought up by stakeholders, and has appropriately disclosed its response efforts and performance regarding material issues.
3. HPC has implemented an internal system to generate, gather and analyze information and data on the Report.

In conclusion, KFQ has found no misrepresentations in the Report in terms of materiality.

## EXCELLENCE

- This is the fourth Sustainability Report published by HPC, and HPC endeavored to report all core indices and additional indices as requested by the GRI Index while applying GRI G3, resulting in transparency of disclosing all indices except those that are not applied.
- HPC has been making efforts to meet stakeholders' expectations by collecting their opinions through various communication channels, determining the significance of their requests and reflecting them in its sustainability management strategy.
- HPC's will to improve sustainability performance was evident in the self-assessment of its corporate social responsibility level according to the standard set by the International Organization for Standardization (ISO 26000). It is recommended that HPC continue to reflect improvements identified through the verification process in order to further enhance HPC's sustainability management and social responsibility.

# Corporate Environment, Safety and Health Policy

As a reliable corporation that builds a new future Honam Petrochemical Corporation promises to observe the following to fulfill its obligation for business sites, partner companies and employees in terms of environment, safety and health

- Put priority on environment, safety and health in business management, and consider them first throughout the entire process of product design, production, use and disposal.
- Observe legal provisions related to environment, safety and health, and try to meet even higher standards.
- Ensure continued low-carbon business management including efforts to prevent environmental pollution, preserve natural resources and energy, avoid use of toxic substance, reduce waste matters and prevent global warming.
- Develop and training programs regarding environment, safety and health based on RC activities.
- Communicate with employees, community residents, customers, shareholders and government officials in an open manner regarding impact of production activities on environment, safety and health, and fulfill social obligations of the company.
- Establish targets to achieve the policy herewith and pursue continued improvement.

## HPC's participation in government's pilot projects

Energy Target Setting Pilot Project

MRV Standardization Pilot Project

Cooperation Project for Measurement of Emissions in Waste Gas Incineration

Cooperation Project in Reduction of Energy & Greenhouse Gases in the Transportation Sector

National Emissions Trading Pilot Project

HAPs Pilot Project

GPS Pilot Project

Voluntary Agreement for Green Purchasing

## Awards and Organizational Affiliation

### 2010 AWARDS

Included in the Socially Responsible Investment index

Selected best company in sector(chemical) by DJSI Korea

Ranked 59th in ICIS Top 100 Chemical Distributors

Won a prize in Innovation Leadership sector of KMA's Management Award of the Year

Gold Tower Order of Industrial Service Merit - President & CEO Chong, Bum Shick

3 Billion Dollar Export Award on Trade Day.

17th Korea Gas Safety Grand Prize II

Green Growth - HPC Yeosu Plant's team leader won a citation

Best company in new entry section in CDP Korea 2010 / Best Materials Company

Special Award at the 9th Information Security Awards hosted by Korea Communication Commission

Yeosu Plant selected as environmentally-friendly business

Citation as Jiaxing's Top 10 Company / Jiaxing Outstanding Manager

Yeosu Plant designated as Green Company

Daesan Plant achieved zero-accident by fivefold of initial target

Yeosu Plant won Korea Gas Safety Grand Prize

Jiaxing Honam Engineering Plastics nominated Outstanding Green Company

Yeosu Plant won the grand prize at the Mother company-Partner company Partnership Model Case Presentation

Honam Chemical Trading selected as Shanghai's Outstanding Foreign Investment Company

New technology certification\_PP resin for car bumper beam / glass fiber

Yeosu Plant won a prize at Mayor of Yeosu's First Aid Treatment in a Disaster Contest

Daesan Plant won the grand prize at the Competitive Exhibition for Chemical Substance Discharge Reduction

Yeosu Plant acquired Certificate of Outstanding Business Site

Performance Citation for 100 Outstanding Projects

Yeosu Plant acquired certificate for voluntary inspection program

Grand Award at Outstanding Socially Responsible Company

Sustainability disclosure

Daeduk Research Institute's executive won the Ministry of Knowledge Economy award at the 2nd

Chemical Industry Day

### AFFILIATION WITH ORGANIZATIONS

Federation of Korean Industries

Korea Employers Federation

Korea Industrial Technology Association

Korea Petrochemical Industry Association

- NOC and PO Council

- Environment & Safety Board

- Korea Responsible Care Association

Korean Tax Association

Korea Specialty Chemical Industry Association

Seoul Chamber of Commerce & Industry

Korea International Trade Association

The Polymer Society of Korea

Korea Management Association

Korea Listed Companies Auditor

Korea Listed Companies Association

Korea Productivity Center

Federation of Korean Industries (Korea Economic Research Institute)

Federation of Korean Industries (International Management Institute)

Korea-Japan Economic Association

Korea Surfactant and Adhesive

Industry Cooperative

Korean Institute of Chemical

Engineers

Korea Chemical Industry Federation

Korea Fair Competition Federation

Incorporated Association Korea

Engineering Club

Surplus Management

ASIA BUSINESS COUNCIL

EPCA

Custom Federation

Daesan Regional Representative

Council

Local Agenda 21 for Susan

Korea Chemicals Management Association

Korea Environmental Preservation Association

Korea Gas Safety Corporation

Korea Fire Safety Association

Korea Radioisotope Association

Korea Electric Engineers Association

Korea Fine Chemical Logistics

Association

