

# ENVIRONMENTAL MANAGEMENT

KKPC strives to build a society in which people coexist with nature. The environment and safety are at the heart of our business operations as we pursue sustainable, green growth in a way to fulfill our corporate social responsibilities and also enhance our competitiveness.

## EHS VISION & INITIATES

KKPC's eco-friendly management is based on its environmental vision of being 'a company that creates the future as a partner of humanity and the environment'. We aim to practice green chemistry, with humankind and the environment coexisting in harmony, so that we set out our environmental, health and safety (EHS) policies in 2018 and put company-wide efforts in order to implement them. The policies consist of pursuing sustainability management, operating a business with a focus on EHS, minimizing environmental pollutants and greenhouse gas (GHG) emissions, increasing employee awareness of EHS, strengthening EHS management and accident prevention activities, and complying with all relevant laws.

Our major environmental and safety goals are achieving zero environmental and safety accidents, reducing the emission of pollutants, maintaining the 'green company' certification from the Ministry of Environment, improving our Productivity Management System (PMS) grade, and reinforcing a culture of safety, and we undertake a range of activities to achieve these goals. For example, as part of our efforts to make the workplace safe and healthy, we have invested KRW 6,521 million since 2015 to remove asbestos, a class 1 carcinogen, and the removal was completed in 2018.

## EHS MANAGEMENT SYSTEM

KKPC operates an integrated EHS management system that is run by each plant site's environmental and safety team under the Senior Executive Vice President of Production, with the CEO taking the overall lead. The CEO also supervises integrated safety and environmental management meetings that take place twice a year. These meetings underline our commitment to safety and environmental management, share information on relevant activities, and address issues that we face at the company level. Integrated safety and environmental management meetings were held in June and December 2018, at which reports were presented on each plant site's safety and environmental performance for the previous year and plans for the year ahead, and other relevant information was shared. As such, based on the integrated operations of our EHS management system, we evaluate all processes, beginning with the acquisition of feedstock, and thus manage and improve all factors that influence the environment and safety.

We have earned EHS-related certifications at our plant sites. In 1996, KKPC became the first company in the world in our industry to obtain ISO 14001 certification, an international environmental certification from Bureau Veritas, an international certification agency. We made preparations necessary for the transition from ISO 14001: 2004 to ISO 14001: 2015 in 2018, and we are now focusing on ensuring that our systematic management is in line with the new standard. We also follow the OHSAS 18001 and KOSHA 18001 safety and health management systems, and evaluate all risks related to health and safety, with a particular focus on managing high-risk activities and facilities.

## RESPONSE TO CLIMATE CHANGE

In recognition of the importance and needs to counter climate change, KKPC has built a corporate-wide system that aims to reduce our GHG emissions, and the taskforce formed in support of this system has formulated mid- to long-term strategies in response. In addition, we partner with outside professional organizations to implement GHG emission reduction projects, including by inspecting emissions levels and analyzing the potential and marginal abatement costs. We also share related issues through a company intranet, while providing educational programs to raise employee awareness. In a way to curtail energy costs, we invested approximately KRW 1,449 million and replaced 16,008 light fixtures with LED equivalents in 2016 and 2017.

In order to satisfy the facility management criteria for the reduction of emissions of hazardous air pollutants (HAPs) stipulated in the Clean Air Conservation Act, we have built an inventory of all possible leakage points, including valves, flanges and gaskets, and operate a leak detection and repair (LDAR) system. We also changed all our pumps to either dual mechanical seal or sealess equipment, in line with the stricter facility management criteria for pumps relating to controlled substances. With a charge for nitrogen oxide being adopted at the end of 2018 and a strengthening of emission standards expected in 2020, we will manage the discharge of pollutants according to internal standards that are stricter than legal requirements. To this end, we will continue to improve our operational methods and facilities.

## REGULATORY COMPLIANCE

KKPC actively complies with all Korean and international laws on chemical safety. In Korea, these include the Act on Registration, Evaluation, Etc. of Chemicals, and the Chemicals Control Act. As part of our response to the Act on Registration, Evaluation, Etc. of Chemicals, we have further strengthened the previous chemical management system and thus established 'KKPC Chemical Management System (KCMS)' in 2016 at all our plant sites. By doing so, we have created an inventory of all the chemicals that we handle, and we transparently and systematically manage all relevant information. In order to produce hazard and risk information on the 510 types of chemicals that are subject to registration with the Ministry of Environment, we formed a joint chemicals registration consortium with member companies of the Korea Petrochemical Industry Association, and completed chemicals registration in June 2018, ahead of the legal deadline. Moreover, in order to respond to the Act on Registration, Evaluation, Etc. of Chemicals, as amended in 2018, we will complete prior registration of all chemicals held in the amount of 1 ton or more by June 2019, and then register each tonnage as required by law.

### 2018 EHS POLICIES

- Pursue sustainability management by establishing an EHS system based on ISO standards
- Put EHS at the center of all business operations
- Minimize environmental pollutants and GHG emissions in order to protect citizens' health and preserve nature
- Increase employee awareness of EHS through consistent education and training, and active communication
- Strengthen EHS management and accident prevention activities in order to achieve zero accidents
- Build an EHS culture by complying with all relevant laws and based on trust

### PROMOTING A CULTURE OF SAFETY AND ENVIRONMENT

#### Safety and environment management system

- Integrated safety and environmental management meetings led by the CEO
- Industrial Safety and Health Committee, EHS Committee
- Safety zone certification for plant sites
- Safety management as a business subject to the Process Safety Management (PSM) system
- Operate environmental management programs, including ISO 14001, Green Company and Responsible Care
- Operate safety and health management programs, including KOSHA 18001 and OHSAS 18001
- Conduct evaluations of process and non-process risk factors
- Establish an emergency response system and emergency scenarios
- Invest in and improve facilities

#### Safety training, campaigns and activities

- Provide safety trainings and measure performance on a regular basis
- Provide safety trainings to new employees and managing supervisors
- Provide outsourced professional safety trainings
- Three zero – zero accident, zero disease, zero pollution – campaign jointly conducted by labor and management
- Safety inspections and patrols
- Safety work management
- Campaigns for safe environment
- Activities to predict risk

#### Suppliers' safety management

- Meetings for permanently-stationed suppliers
- Safety and health meetings attended by representatives from suppliers
- Joint safety inspections with suppliers
- Safety evaluations on suppliers
- Implement win-win cooperation programs for safety and health

### INVESTMENT IN ENVIRONMENT AND SAFETY

(Unit: KRW million)



\* Investment in environmental facilities, safety facilities and environmental safety