

## SHE (Safety, Health, Environment) Management

SK innovation applies the concept of CSV(Creating Shared Value), which secures trust from the society and grows and develops with society beyond the conventional concept of social responsibilities such as minimizing accidents and pollutants.

As this is the aim of SHE management pursued by SK innovation, we aim to achieve the status of a global top tier company by establishing and operating higher SHE standards than legal requirements and growing into a role model for similar companies in the industry.

### — SHE Management System

SK innovation has analyzed required management factors for safety management by global advanced companies, established 13 major management factors encompassing those analysis results and reflected the operating system to implement these factors in the company's regulation.

In addition, we carry out activities to boost the implementation of a system based on CEO leadership and perform the SHE audit on a regular basis to improve and supplement any insufficiencies to set up and operate a virtuous cycle of "Plan-Do-Check-Action".

#### ● SHE Management System Framework



### Operation of Occupational Safety and Health Commission

SK innovation runs the Occupational Safety and Health Commission at each business site in accordance with the Occupational Safety and Health Organization. The commission is composed of equal numbers of labor union members and managers, and includes the representatives of workers and workplaces.

In the Occupational Safety and Health Commission, both labor union and company discuss and decide important safety and health issues such as raising safety awareness and improving working clothes to prevent any occupational accidents and improve the working environment for employees.

### — Chemicals Management System

With increased social awareness of the risk of chemicals and greater needs for seeking practical management measures, the government has revamped the existing legal system for managing chemicals, handling chemical accidents and providing relief and reinforced the level of supervision of chemicals. To deal with these changes, a company is required not only to identify and collect data for the current status of chemicals used, but also to manage chemicals more systemically through the entire process from the introduction of chemicals to the manufacturing, storing, transporting, selling and disposing of chemicals.

### Integrated Chemicals Management System

SK innovation aims to protect the safety and health of stakeholders and minimize environmental impacts from business. The company establishes and operates the Integrated Chemicals Management System so that chemicals can be managed in a safe and systemic manner through the entire process from adopting raw chemicals and manufacturing new chemicals to transporting and selling the materials.



**Purchasing chemical substances** | Prior to a new chemical substance being purchased, the company will first assess the level of hazard and toxicity and check to ensure safe storing and usage conditions are in place. The Material Safety Data Sheet(MSDS) is used to confirm basic hazard and toxicity data. Based on this data, a hazard assessment is conducted to evaluate the risk to our stakeholders, suppliers' employees, local communities and production facilities, after which a decision is made on whether to import the relevant chemicals.

If purchasing the chemicals under current conditions is deemed potentially hazardous, necessary actions are implemented to eliminate the risk and to secure conditions for safe usage of such chemicals. In addition, all chemicals are registered in the internal chemicals management system linked to the company's procurement system. Information on any necessary measures, such as licenses and permits, is supplied to the relevant department, which ensures that key factors for legal compliance related to the chemicals are not overlooked, and information is utilized and managed in a timely manner.

**Producing chemical products** | In order to prevent external chemical exposure externally or to persons handling such material, most of SK innovation's facilities that store or handle such material adopt a sealed design. In particular, we operate a Leak Detection and repair(LDAR) system to prevent even minor leaks that many occur in vulnerable areas, such as control panels or the connectors between different equipment.

For all chemicals used or produced within the company, a MSDS is created and used. This MSDS used to train personnel or supplier employees about the precautions before they handle the material. In addition, a copy of the MSDS is kept on-site to allow everyone to refer to it. Moreover, a full inventory of all chemicals within the organization is created to ensure information, such as the volume produced and the properties, is managed in a comprehensive and organized manner.

**Transportation and sale** | Chemicals generated in the production process or products that contain chemicals must comply with domestic laws. To export overseas, they must also comply with international conventions, such as Europe's Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

SK innovation has established a process to ensure all chemical products manufactured are in compliance with these standards and all necessary permits have been obtained prior to transporting or sale.

In addition, we supply the MSDS directly to the customer to clearly inform them about the safety and health information required for the handling of the material. Stakeholders can easily access this information online through the company's website.

— Occupational Safety and Health Activities

**Emergency Response System**

SK innovation operates an emergency response system to strictly cope with any emergency situations such as fire, explosion, leakage of toxic gas or natural disaster. With the aim of disseminating and coping with any incident swiftly, the company has an in-company emergency response group and establishes and operates safety facilities suitable for the characteristics of the process in each process to focus on preventing the spread of the incident through early response.

In particular, the Ulsan Complex organizes its emergency response group based on the office of emergency management and on-site command office under the supervision of a business director and leadership of a plant director, including technical support, contact, administrative support, financial support, on-site support, on-site response, fire extinguishing and prevention squad and personnel control squad. The emergency response group is operated by systemic division based on the size classified into Levels 1 to 5.

**Implementation of Joint Emergency Response Drill**

SK innovation has established a company-wide emergency response drill system and expanded the existing emergency response drill, which was previously site-based, to the entire company. With regular and repetitive implementation, all members of management, including the CEO, fully acknowledge the roles of each functional group and emergency response process in the case of an emergency. These efforts contribute to dealing with any emergency immediately.

**Introduction of the Company-Wide Safety Talk**

SK innovation emphasizes the importance of safety and implements the company-wide Safety Talk system to make safety culture one of the daily requirements. Before a regular meeting starts, all SK innovation members are required to share safety-related cases, which enhance the level of all members' awareness of safety.

**Health Management for Employees**

SK innovation prepares health-related facilities and operates various health programs to allow employees to commit themselves to work more smoothly in a healthy condition through systemic health management. In particular, the Ulsan Complex runs an in-company medical center and provides a support program to present the right direction for health management and improve daily routines for health. In 2017, the company provided training for weight management and appropriate exercise and health education to prevent lifestyle diseases and operated the health experience promotion hall; 2,822 employees, including those from suppliers, participated in health management programs.

— Respond to Climate Change

SK innovation manages the usage of energy based on the 'Guidelines for the Operation of Greenhouse Gas and Energy Target Management' led by the government and collects data through the Greenhouse Energy Management System. This system is currently being redeveloped after the integration of the OIS (Operation Information System) and will be upgraded to the system, which is optimized to collect the amount of energy use and GHG emissions at a business site.

**Energy Use**

SK innovation affiliates established the target of reducing the amount of energy use by 7.8% compared to BAU by 2025 through enhancing energy consumption efficiency at major business sites with high energy consumption such as Ulsan and Incheon. In 2017, 52,763,776MWh was used in total, a decrease of 0.5% compared to the target of energy use.

**GHG Emission**

The amount of GHG emissions is calculated on the basis of the Korea Emission Trading Statement Guidelines. The scope of calculation includes the petrochemical, chemical and lubricant business sectors, including Ulsan Complex (SK energy, SK global chemical, SK lubricants), SK Incheon petrochem's Incheon workplace, as well as the R&D, logistics, other business sectors; overseas workplaces and the supply chain are excluded. In 2017, total GHG emissions by SK innovation were 12,903,207tCO<sub>2</sub>eq. To deal with the Emission Trading Scheme more effectively, which has been implemented since 2015, the company has set and managed a GHG emissions target and a basic energy use target.

SK innovation affiliates established the target of GHG emissions based on the NDCs (Nationality Determined Contributions) and aim to reduce emissions by 7.8% compared to BAU by 2025. In 2018, when the secondary allocation plan led by the government is determined, the company will modify the reduction target to align with the national target.

— Reduction of Environmental Impacts on Business Sites

**Water Resource Management**

Major sources of water for SK innovation include the Daechong Dam, the Daeam Dam, and Asan Bay. Water usage is calculated based on the water bills for headquarters and major domestic business sites. In 2017, the total usage of water was 53,071,840m<sup>3</sup>.

● Current Status of Water Pollutants Management

Business Site	Wastewater Treatment Facility	Treatment Method	Emission Site
SK energy (Ulsan)	Ulsan Complex Wastewater Treatment Facility	Biological + Advanced treatment	Public water body (East Sea)
	No. 2 FCC Wastewater Treatment Facility	Biological treatment	Yongyeon Sewage Treatment Plant
SK global chemical (Ulsan)	PE-PP Wastewater Treatment Facility	Physicochemical treatment	Yongam Wastewater Treatment Plant
	EPDM Wastewater Treatment Facility	Biological treatment	Yongam Wastewater Treatment Plant
SK incheon petrochem (Incheon)	SK incheon petrochem Wastewater Treatment Facility	Biological + Advanced treatment	Gajwa Sewage Treatment Plant

**Management of Air Pollutants**

SK innovation operates odor-prevention facilities to sustain a pleasant air environment in the local communities and business sites, and also runs a channel for reporting civil complaints regarding environmental issues.

In addition, the company applies an LDAR<sup>2)</sup> system at arsenic acid discharge facilities, including pumps, flanges, and valves, and monitors such facilities at least once per year to prevent any damage by hazardous air pollutants (HAPs<sup>1)</sup>). We also monitor the current status of air pollutants from major discharge facilities at business sites, such as a heating furnace and boiler by using TMS<sup>3)</sup> on a real-time basis to eradicate any possibility of air pollution.

Note 1) Hazardous Air Pollutants  
Note 2) Leak Detection and Repair  
Note 3) TMS: Telemetering System

**Water Pollution Management**

SK innovation has installed and operates a high-efficiency biological wastewater processing facility which uses remote water quality monitoring technology and a control system. Polluted wastewater from the production process is finally discharged through an activated carbon tower, and a more stringent wastewater discharge concentration level than the legal standards is applied for strict management. We also strive to minimize the wastewater discharge by partially recycling processed wastewater to be used for fire extinguishing and landscaping.

**Waste Management**

SK innovation manages the amount of waste discharge by using an independently developed waste management system. Any generated waste is processed by consigning the task to a specialist company whose consignment ability is verified, while 60% of the total waste (approximately 0.1 million tons) is recycled. In particular, in 2017, the company reduced the amount and cost of waste oil generated by partially disposing of waste oil collected from waste treatment facilities and re-inputting waste oil to a crude oil tank.

In preparation for the Framework Act on Resource Circulation, which is supposed to be implemented from 2018, we are deliberating measures for recycling about 25,000 tons of waste, which is reclaimed and incinerated, to prevent as much waste as possible and ensure circulated use and appropriate waste treatment. We also proactively implement waste reduction activities by reinforcing separate collection for existing waste and finding recycling companies.

Activity of Reducing Benzene in Ulsan

According to the results of measuring the concentration level of benzene in Yecheon-dong, Ulsan where a business site is located, the level exceeded the environmental standard of 5µg/m<sup>3</sup> for six consecutive years from 2011 to 2016. Under these circumstances, SK energy and SK global chemical participated in the 'Committee for Benzene Air Quality Improvement in Namgu, Ulsan', which was organized with the Environmental Office for Nakdonggang River and 16 business sites and implemented activities to reduce air pollutants. Through such efforts, the company contributed to meeting the environmental standards, according to the Ulsan Yecheon-dong Measurement Station in 2017.

To continue pollutants reduction activities, the company additionally concluded the "Voluntary Agreement for Benzene Air Pollutants Reduction for Sustainable Development" with the Office of Nakdonggang River in the presence of the Minister of the Environment in February 2018. Through this, we have organized the environmental management improvement task force and gradually implemented facility improvement for improvement items.

— Efforts for Preventing Oil Spill

Prevention of Marine Pollution

SK innovation prepares work standards and procedures and reinforces on-site monitoring practices to prevent any marine pollution accidents. With monthly marine emergency response drills, we strive to minimize accident damage and have appointed a marine pollution prevention manager for each shift group in marine facilities (buoy, Dolphin, crude oil tank and petroleum product tank) to prevent accidents even on the nighttime shift.

Soil Environment Management

SK innovation voluntarily purifies contaminated soil with according to the agreement of “Voluntary Agreement for the Preservation of Soil Environment” in order to prevent and manage soil contamination. We also consign a soil contamination survey to a specialized institution every two years to determine whether soil is contaminated. If any site is found to be contaminated, the soil is purified immediately by a specialized purification company.

• Current Status of Prevention Equipment Purchase in 2017

**2,000**  
Split Oil Treatment Agent  
(Unit: ℓ)



**800**  
Split Oil Absorbent  
(Unit: kg)



• Current status of oil fence establishment



Risk detecting drill and safety meeting



Emergency mobilization



Prevention by external oil fence



Prevention by installed oil skimmer in the oil fence

# Appendix

- 082 Materiality Test
- 084 Stakeholder Engagement
- 085 ESG Data
- 094 GRI Index
- 096 Independent Auditor's Report
- 097 Financial Statements
- 098 Independent Assurance Statement
- 100 Greenhouse Gas Verification Statement
- 101 Membership Status
- 102 Publication History of Sustainability Report
- 103 About This Report