

# Reducing Environmental Impact

ESG  
Performance  
Report 2021

## Reducing Environmental Impact

### Energy Management

#### Energy Consumption Management

SK innovation is systematically managing its energy consumption with pre-determined energy conservation target. For enhanced credibility, each business site's energy consumption level is quantified and assured by a third-party. In particular, the Ulsan CLX uses OASIS (next generation production data management system), developed based on standardized reference data, to accurately compute the data. The resulting data then serves as the basis for calculating greenhouse gas emissions and ensuring more efficient management.

#### Operational Efficiency Improvement

SK on is making various efforts to achieve its goal of reducing energy consumption by 5% each year. In the previous year, the company managed to reduce approximately 7% of its total energy consumption compared to 2020 and saved KRW 2.3 billion by minimizing the usage of coolers and air conditionals in electrical rooms at the same time optimizing the airflow in clean rooms and improving steam boiler efficiency.

### Air Quality Management

#### Pollutant Control

SK innovation is endeavoring to reduce air pollutant emissions generated at its business sites by actively investing in air pollutant reduction systems and alternative fuels in combustion facilities.

#### Setting Targets for Reducing Air Pollutant

SK innovation put air pollutant emission control as its top priority as it sets the highest goal of reducing emissions in addition to meeting the annual emission cap. The goal is to reduce nitrogen oxide (NOx) emissions by 34% and sulfur oxides (Sox) by 72%<sup>1)</sup> by 2030 through corporate-wide activities.

#### Compliance to National Air Pollutant Emission Cap Regulation

SK innovation is working hard to ensure the compliance of its business sites that newly became the subject of the enhanced National Air Pollutant Emission Cap Regulation comply. Under the enhanced regulation, all subjected business sites bear the obligation to meet annual emission quota during the first implementation phase, from 2020 to 2024. In response to the regulation, the Ulsan CLX will invest more than KRW 300 billion in its facilities by 2024 to replace boilers with clean fuel as well as to install furnaces for nitrogen oxides (NOx) reduction. By doing so, it will be able to directly reduce fine dust in the air and indirectly reduce greenhouse gas emissions, contributing to nation-wide climate change mitigation.

1) Average for SK innovation subsidiaries compared to 2018



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### Air Quality Management

#### Signed Agreement for Air Pollutant Reduction

The Ulsan CLX has signed voluntary agreements with 30 companies as well as Ulsan City and the Environmental Office to maintain and manage the air quality in Ulsan and protect the health of local residents. The target set through this agreement is to reduce the emission of fine dust, sulfur oxides, nitrogen oxides and VOC (volatile organic compounds) by 40% from 2014 to 2022. In addition, the Ulsan CLX entered into agreements with Ulsan City, the Environment Agency, and 16 companies to further reduce the emission of benzene. The purpose of this agreement is to reduce benzene emission level in Ulsan, which has been frequently exceeding the environmental standard. SK innovation, along with other companies that use and handle benzene, will continue to voluntarily reduce benzene emission by making necessary facility improvements.

#### Reducing Air Pollutant Emissions

The Ulsan CLX and SK incheon petrochemical conduct annual emission checks on more than one million source points of arsenic acid to minimize the emission of harmful air pollutants scattered from process valves, flanges, and pumps while adding more TMS (Tele-Monitoring System) every year to enhance the control. In response to growing regulatory demand, the Ulsan CLX and SK incheon petrochemical set a plan for investment in oil vapor treatment systems in storage facilities and are currently implementing in phases. In addition, RTOs (Regenerative Thermal Oxidizers) have been installed in order to prevent damages from odors generated at facilities such as a wastewater treatment plants. Monitoring systems for odors control are also installed at the outskirts of facilities.

### Water Quality Management

#### Water Resource Control

The main sources of water intake for SK innovation's business sites include Daecheong Dam, Daeam Dam, and Asan Bay. Each business site is implementing various waste water reclamation measures to reduce water consumption as well as to provide a stable supply of water required for production.

#### Reduction of Water Pollutant

SK innovation applies standards that are stricter than those required by the laws, including the Water Conservation Act, to minimize its impact on water sources such as rivers and streams. Wastewater from each business site is managed through biological wastewater treatment facilities equipped with a water quality monitoring system. Wastewater containing pollutants is treated through adsorption towers or fiber filters. Both for water conservation and wastewater reduction, some of the effluents are reused for firefighting or landscaping and, if proven possible through property analysis, reprocessed and recycled as industrial water.

### Water Pollution Management

Business Site	Treatment Facility	Process Method	Discharge Site
SK energy (Ulsan)	Ulsan Complex Treatment Plant No.2 FCC Treatment Plant	Biological, advanced Biological	Public waters (Donghae) Yongyeon Sewage Treatment Plant
SK geo centric (Ulsan)	Synthetic Resin Channel #1 Wastewater Treatment Plant Synthetic Resin Channel #2 Wastewater Treatment Plant	Physicochemical Physicochemical	Yongam Wastewater Treatment Plant Yongam Wastewater Treatment Plant
SK incheon petrochemical (Incheon)	-	Biological, advanced	Gajwa Sewage Treatment Plant
SK innovation (Cheonju)	-	-	Cheongju Industrial Complex Wastewater Treatment Plant

### Waste Management

#### Systemic Approach to Waste Management

SK innovation has set standards for the storage, transportation, discharge, and treatment of waste generated during the production process for waste minimization as well as efficient and legitimate treatment of waste. Through a self-developed waste management system, SK innovation is systemically managing the level of waste generated. Qualified service providers are employed to recycle, incinerate and bury waste. The amount of waste discharged and the types of waste handed over to the service providers are reported to Allbaro System. Annual waste generation predictions and reduction targets are calculated based on previous year's data with monthly waste generation performance is recorded. Recyclable waste is processed and sold. All waste is transported and stored in airtight containers to minimize odors and air pollutants emission during the entire process from generation, transportation to storage.

### Chemical Management

1) A system equipped with a new chemical database and MSDS algorithm, improved compared to the existing system that only supported reading and searching of MSDS.

#### Introduction and Handling System

According to the amendment of the Act on Registration, Evaluation, etc. of Chemical, SK innovation is required to submit MSDS (Material Safety Data Sheets) to the government for its products and semi-finished products for approval within the next five years. As a response to the Act, SK innovation registered data and safety guidelines in the e-MSDS system<sup>1)</sup> and providing them to customers along with the MSDS.

#### Chemical Risk Assessment

When introducing new chemical substances or change existing ones, SK innovation conduct a handling and use risk assessment. By identifying and eliminating risk factors, we seek to prevent accidents and protect workers.

#### Hazardous Chemicals Handling and Manufacturing Equipment Safety Management

To prevent leakage accidents in accordance with the Chemical Control Act, SK innovation installed a system that can detect any leak in a facility that stores acidic or alkaline materials. With an aim the enhance leakage prevention and management, a total of KRW 5 billion was invested to install the system at 145 facilities across the country.

## Reducing Environmental Impact

### Prevention of Oil Spill

#### Soil Pollution Management

##### Soil Pollution Survey

A department in charge of environmental management at each business site of SK innovation tracks and manages soil pollution by overseeing a regular pollution test and identifying sources of pollution. The test is outsourced to an independent agency. When pollution is detected, a specialist organizes cleanup activities. After the cleanup, the result is verified by the survey agency. To actively prevent and manage soil pollution, we voluntarily signed an agreement with the Ministry of Environment and are currently carrying out additional test for soil pollution.

##### Signed Agreement for Soil Remediation

The Ulsan CLX has signed the Agreement for Soil Remediation with the Ministry of Environment to mitigate the risk from soil contamination. Related mitigation activities will be carried out by March 2023. The Ulsan CLX is also equipped with vehicles for prompt response on site in the case of chemical accidents.

##### Prevention of Oil Spills

SK innovation organizes various activities to prevent soil contamination caused by oil spills. Typical activities conducted include, but are not limited to: provision of pollution control equipment at key locations, installation of steel plates for emergency shut-off in waterways, and organization of on-site training on appropriate pollution control methods. In order to strengthen the pollution control capabilities of each business site, we will set up equipment-specific emergency response scenarios and conduct effected emergency response training.

#### Marine Environmental Pollution Management

##### Emergency Response Training to Prevent Marine Pollution

SK innovation has established detailed emergency scenarios to promptly respond to oil spills and other types of marine pollution accidents. Every month, emergency response training is conducted and equipment and facilities are inspected. We also organize joint private-public training with the Self-Prevention Agency twice a year.

##### Marine Facility Monitoring System

SK innovation has set standards and procedures to prevent accidents that can cause marine pollution and regularly conducting self-inspections on each facility. By designating a manager in charge at each marine facility, we maintain strict control and oversight 24 hours a day to prevent accidents. As a result, we have been accident-free so far. . Going forward, we will continue to manage risks associated with marine pollution through emergency response training and marine patrol.

### Biodiversity Protection

#### Biodiversity Policies

SK innovation is keenly aware of the importance of biodiversity protection and striving not to damage biodiversity in the course of its business operation. First of all, we plan to conduct an environmental impact analysis prior to the beginning of each project to check the status and value of biodiversity and monitor the result regularly. This policy will be applied not only to the business site of SK innovation and its subsidiaries but also to the entire supply chain. In compliance with the Convention on Biological Diversity (World Heritage Areas, IUCN Category I-IV Protected Areas), we will make sure that all business sites located in the protected areas conform to national and local requirements. Furthermore, all the necessary measures to be taken to prevent loss (No Net Loss, NNL) and make a positive impact (Net Positive Impact, NPI) will be taken to protect rare and endangered species.

#### Biodiversity Conservation

SK innovation invested a total of KRW 102 billion from 1996 to 2005 to build the Ulsan Grand Park and after the completion donated it to Ulsan Metropolitan City. The park is designed to preserve endangered species in the country and provide educational content for citizens through the Ecotourism Center. The park's Wildlife Rescue Center conducts wildlife rescue, treatment and rehabilitation activities to protect the ecosystem at the same time preserving and restoring genetic resources of wildlife. Since 2018, SK innovation have restored 170 ha of mangrove forests in Vietnam. Also, we are currently implementing 'Intsia Bijuga' conservation pilot project to protect the species from extinction. Moving forward, we will continue to preserve of the ecological values of mangrove forests, which are habitats and food sources for various terrestrial and aquatic animals and plants.

## Strengthening Environmental Management through Audits

At SK innovation, a department in charge of company-wide SHE management conducts environmental audits every 1 to 3 years at all domestic business sites. These audits allow us to check and improve the implementation status of its environmental policies and each business site's working procedures by category. Through internal and external environmental inspections, legal issues and the actions each business site has taken in response to the enactment and revision of related regulations can also be checked. In addition, the business sites that have acquired the ISO 14001 environmental management system certification conduct annual internal audits to check their compliance to the regulations as well as on-site implementation status in light of the certification standards. Follow-up audits are conducted for the verification of the adequacy of these business sites' systems as well. In 2021, self-assessment, and second- and third-party audits were performed, and the ISO 14001 certification was renewed accordingly.

#### Results of the 2021 Environmental Audit

Category	Subject	Audit result	Status of action
Regular SHE environmental audit	SKON, SKIPC, SKIET	Findings: 28 cases	
		Opportunities for improvement: 15 cases	Actions completed
Internal audit for the ISO 14001 Certification	SKE, SKGC, SKL, SKIPC	Minor non-conformity: 5 cases	
		Serious non-conformity: 0 cases	-