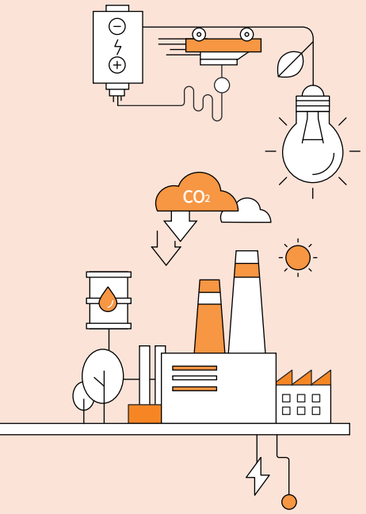
Material Issue 02

Paris Agreement and Climate Change



How does it affect SK innovation?

Stakeholders' Impact Evaluation[1)]

Issue	Financial Impact	Reputational Impact	Operational Impact	Strategic Impact
Responding to Climate Change				●
Eco-Friendly Energy Technology				●

Note 1) Selected the most frequently indicated impacts after conducting surveys on stakeholders

Why is it important?

Significance of the Issue

Under the Paris Climate Treaty of 2015, Korea proposed a 37% reduction in greenhouse gas emissions by 2030 compared to BAU, of which 11.7% was allocated to the industrial sector. Thus, the role of companies in fulfilling environmental responsibility has become more important. Moreover, as the government recently tightened its regulations on greenhouse gas emissions, factors such as the purchase of carbon credits and rising energy costs are recognized as potential risks for business activities. In particular, the oil refining and petrochemical industries are in need of more active measures since energy consumption and greenhouse gas emissions are high due to the nature of the industries.

How did we respond?

Strategic Approach

- Establish strategies for emission trading
- Expand investment in renewable energy
- Increase energy efficiency throughout production process

How do we manage performance?

Performance Measurements

- Management of GHG emissions target
- Minimization of risks in the emission trading system

Link to SDGs

Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 13 Take urgent action to combat climate change and its impacts

— Respond to the Emission Trading Scheme

SK innovation, along with SK energy, SK global chemical, SK lubricants, and SK incheon petroleum, is subject to the government's allocation of the greenhouse gas emission allowance. Thus, we are committed to meeting our legal obligations under the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits which was implemented in 2015. Dealing with a new system stably, we reduced emissions during the first phase of the emission trading scheme (2015-2017) by calculating the optimal amount of emissions for each company, introducing external waste heat, and investing in greenhouse gas reduction measures.

Moreover, we established strategies and procedures for emission trading to cope with the market environment and regulations for the introduction of the emissions trading scheme and have enacted and operate the procedures to operate the emission trading system. Our strategies for emissions trading include measures by phase for securing budgets, executing, and purchasing, as well as measures to cope with the potential increase in the price of carbon credits resulting from the companies' purchase, and measures to secure additional carbon credits in case of a production increase. Our procedures for emission trading defines the relevant roles of each business division, and the detailed procedures of budgeting for emissions trading, organizing an Investment Committee, and executing the budget.

We drew up investment guidelines to assist in prioritization based on the price of carbon credits.

In 2017, when the first phase ended, SK innovation and affiliates sold some of our surplus carbon credits that resulted from internal and early-stage reductions and optimized emissions calculation methods. In 2018, after the government's carbon certification is completed, we will decide on the amount to be sold and sell off carbon credits on time in consideration of governmental restrictions on carryover.

— Improve Energy Efficiency of the Production Process

In order to optimize the production process at workplaces, SK innovation replaced existing equipment with new and high-efficiency equipment; introduced new processes and catalysts; utilized waste heat to generate power and produce steam; and adopted effective energy management strategies.

Replacement of Air Preheaters

Invested KRW 3.7 billion

Reduced 7,000 tonnes of CO_2

Installation of Flat Heat Exchangers

Invested KRW 6.1 billion

Reduced 17,000 tonnes of CO_2

Recycling Energy through Waste Heat Recovery

7,501 TJ

GHG Reduction though Efficiency Improvement of Furnace

SK innovation invests in various areas to minimize greenhouse gas emissions throughout the manufacturing process. In 2017, we invested a total of KRW 3.7 billion in the replacement of air preheaters, cutting CO_2 emissions by about 7,000 tonnes, and invested KRW 6.1 billion in the installation of flat heat exchangers, reducing CO_2 emissions by 17,000 tonnes.

Reduction in Power Consumption

In 2015 SK innovation implemented a master plan for energy efficiency to reduce power costs for fuel, steam and electricity, which account for the largest portion of operating costs. Our master plan concerns the supply and consumption aspects of fuel, steam, and electricity. When we put the plan into practice, we consider the effects and timing of investment by item. Through this master plan, we saved about KRW 25 billion in energy costs by 2016. In addition, we established an investment plan for 2017 and 2018 by continuously searching for any aspects for potential improvement. We also determined which parts of the plan are in need of improvement by evaluating technical feasibility, field applicability, and economic feasibility of the investment business. We expect to save KRW 21.7 billion in total from 2017 to 2018.

Waste Heat Recovery

SK innovation recovers waste heat generated from high-temperature water, steam, and gas, and recycles them into energy. In 2017, a total of 7,501TJ of waste heat was recovered at the Ulsan Complex (SK energy, SK global chemical, SK lubricants), saving KRW 96.8 billion in energy costs.

As a result of our efforts to use energy efficiently at our workplaces, total CO_2 emissions have decreased by 380,831 tCO_2.

Monitoring Energy Usage with Energy Intensity Index (EII)

SK innovations saves energy not only through facility replacement such as investment and process improvement, but also by utilizing EII[1] to monitor energy usage every two years. Based on the EII, we set and manage energy intensity targets that reflect the optimal conditions for each process. The results of each week's energy analysis are shared with each production team to encourage more specific energy saving activities. These efforts enabled us to reduce EII by 1.1 in 2016 compared to 2014, which is the equivalent of KRW 12 billion of savings. Currently, we are preparing for a re-evaluation in 2018.

Note 1) Energy Intensity Index: Indicates the amount of actual energy consumption per process compared to standard energy consumption per process. The indicator is used to benchmark domestic and foreign industrial peers.

Installing Solar Power Generators

— Investment in Renewable Energy

SK innovation is expanding investment in renewable energy and introducing renewable energy technologies. This includes investment of KRW 2.31 billion in the installation of 0.936MWh of solar power generators, and management of the power load in workplaces by using fuel cells.

Jeungpyeong solar power plant

Efforts to Reduce Greenhouse Gas Emissions around the World

Project to Restore Mangrove Forests in Vietnam

Mangrove, a subtropical plant, is capable of storing 34 tons of CO_2 per 1 ha of forests, and thus is called a CO_2 storage warehouse. This is why the plant attracted global attention as a major countermeasure for global warming. However, marine pollution, development of tourist attractions, and other factors have destroyed 66% of the world's mangrove forests.

In order to respond to climate change and preserve biodiversity on a global scale, SK innovation launched a project to restore mangrove forests in Vietnam. These forests are highly vulnerable to climate changes such as the rises in sea level. The project aims to create a 5ha mangrove forest in Zhebin province in Vietnam by 2018, and the Vietnamese government will join the project.

Mangroves in Vietnam

Plan for the Use of Donations

Donation Amount

80 million (KRW)

Donation Item

a 5ha forest with

15,000 trees