

Investing in Low Carbon R&D

There is a growing social interest in environmental issues such as waste management and GHG emission reduction, along with uncertainties caused by increased volatility in oil demand, expansion of demand and supply of renewable energy, and increasingly stricter regulatory requirements. In response to these changes in the business environment, SK innovation announced the 'Carbon to Green' strategy through the Financial Story in 2021 as part of its efforts to support sustainable growth. To promote this strategy consisted of Green Anchoring¹⁾ and Green Transformation²⁾, we have to invest in R&D more effectively. Accordingly, we have set 'Investing in Low Carbon R&D' as one of our priority tasks under our GROWTH strategy to develop key technologies that serve as the foundation while exploring new areas of technology to secure growth engines for the future.

¹⁾ Creating a green portfolio with focus on batteries

²⁾ Transition to green business model



A study on the utilization of pyrolysis refined oil produced with plastic wastes

Priority Task Implementation Strategy (Mid/Long-term Strategy)



In order to make the 'Carbon to Green' strategy more effective, it is integral to converge existing technologies we have gained with new ones. Previously accumulated technological expertise and know-how can serve as a basis for developing a new portfolio. However, since these won't have all the elements necessary for a successful portfolio composition, it is also necessary to introduce and internalize new technologies and knowledge. For securing and internalizing new capabilities, SK innovation is promoting technology verification and acquisition through cooperation with numerous universities, institutions, and companies all over the world, preparing to establish worldwide bases to strengthen open innovation and enhance execution. As part of these efforts, SK innovation intends to establish "Green Techno Campus" (tentative name) in the metropolitan area jointly with SK group subsidiaries, planning to create opportunities to discover promising technologies by establishing and expanding the global base centered in Silicon Valley, the United States, for strengthening open innovation in the future.

SK innovation will proceed to expand its portfolio by exploring new green business opportunities based on technology in consideration of market trends such as changes in the global energy mix.

Action Plans for 2022

SK innovation is continuously focusing on developing its R&D capabilities for green technologies to solve global environmental issues such as climate change and waste plastic. Through our R&D efforts, we will turn these imminent crises into opportunities.

R&D Themes for 2022

 <p>Green Anchoring</p>	<ul style="list-style-type: none"> · Next-generation battery technology with focus on all-solid-state batteries · Technologies for waste battery recycling and cathode material recovery · Competitive edges in the information and electronic materials business with focus on battery separators and display materials
 <p>Green Transformation</p>	<ul style="list-style-type: none"> · Technologies for waste plastic recycling · Technologies for CCS and CCU · Technologies for wastewater treatment and industrial water recycling technologies · Solutions for green packaging and lightweight materials · Green raw materials and products such as premium asphalt and biofuel · Technologies and lubricants optimized for EVs · Solutions for recycling waste lubricant · Eco-friendliness of products throughout the entire process

Alignment with UN SDGs



Goal for 2025



Making R&D investment until the cumulated amount reaches

KRW 1.2 trillion by 2025

Progress in 2021



Made R&D investment worth of

KRW 363,341 million

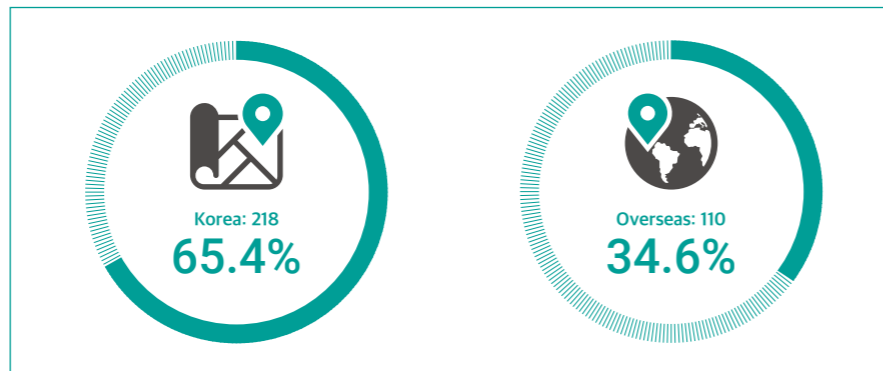
Progress in 2021

SK innovation has made aggressive investment in R&D in line with the 'Carbon to Green' strategy. The total amount of R&D investment in 2021 reached KRW 363,341 million. We also registered 318 patents and utility models globally.

The key progress we made in terms of Green Anchoring includes the recovery of anode materials from waste batteries and the next-generation battery sector. The recovery of anode materials from waste batteries would solve environmental problems and the supply and demand of raw materials. In 2021, we completed a pilot plant for the technology and are working on the commercialization process. In order to lead the next-generation battery market with a high level of energy density and safety, the next-generation battery research center was built in July 2021 and is carrying out independent research and development projects. We also have invested USD 30 million in Solid Power, a leading US-based battery developer, and signed an agreement for its joint development and commercialization.

In terms of Green Transformation, we are in the process of developing our own post-treatment technology of pyrolysis oil for waste plastic, and have made great progress in developing waste plastic recycling technology by introducing pyrolysis oil to the process at Ulsan CLX for the first time in Korea. We also launched packaging materials with better recyclability in partnership with other companies. In the asphalt business, one of the busiessses emitting larger amount of the GHG, we have released products that reduce carbon emissions while in use by lowering the temperature during asphalt concrete production and construction and enabling the recycling of waste asphalt.

Number of patents and utility models registered in 2021



Comments from the Department in Charge

One of the key factors for the successful implementation of the Carbon to Green strategy is advanced technology. The Institute of Environmental Science & Technology and Battery Research Center have accumulated technological expertise based on their extensive experience, and they are now working toward achieving success in the new research projects.

In 2022, we are taking on new challenges based on 60 years of experience. Despite many obstacles, we are dedicated to taking the lead in overcoming these challenges with strong expertise and commitment of the Institute of Environmental Science & Technology and Battery Research Center as we pave the way toward the next 60 years.



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