



# GREEN INNOVATION

Solidify SKI's identity as a Green Energy and Materials Company through Low-Carbon Businesses.

## 2022 Achievements

Increased ratio of green assets to the energy & chemical business through the innovation of the biz. portfolio



**1.1** times

Social value (SV) creation by environmental products and services



KRW **499** billion

The world is witnessing a rapid paradigm shift to a decarbonized society. SK Innovation is one of the prime movers having readily prepared for these developments from early on. Embracing the Carbon to Green transition, the company will make a spurt in creating a low-carbon business portfolio and expanding green business models, thus increasing the shares of products and services creating environmental value. This way, we will continue to grow our corporate value as a global supplier of green energy and materials.

# Expansion of the Green Portfolio

SK Innovation is looking to innovate its business portfolio by expanding the battery and materials business and upgrading the energy and chemical business. This is our approach committed to handling the external business environment preemptively, where a global energy transition is taking place towards a carbon-free economy, and to enhance corporate value by satisfying the stakeholders' expectations in the market.



## 2025 Targets

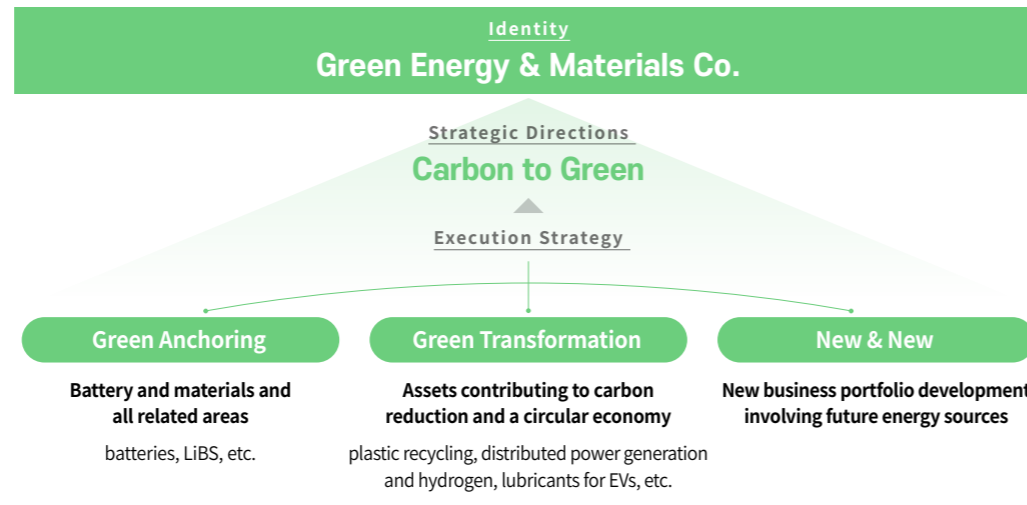
Double the ratio of green assets to energy & chemical assets through the innovation of the portfolio:

**2** times

- Green assets: assets that contribute to cutting carbon emissions worldwide and promoting a circular economy and are used to supply sustainable energy
- Classification as green assets: Tangible/intangible assets and investment assets in the balance sheet are classified as green/carbon assets.

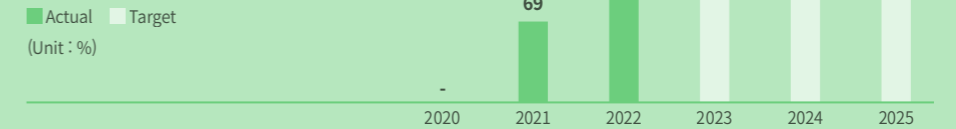
## Strategies to Achieve Key Tasks (Mid-to Long Term)

“Carbon to Green” is a strategy SK Innovation pursues as a global supplier of green energy and materials, and we aim to increase the ratio of green assets to energy and chemical assets to 200% by 2025. To make it happen earlier, various initiatives are currently implemented: “Green Anchoring” to expand the battery and materials business worldwide, “Green Transformation” to create greater value through a green transition in the energy and chemical business, and “New & New Strategy” to secure and commercialize new green technologies.



## Progress & Roadmap

Ratio of green assets to energy & chemical assets



## Major Activities Planned for 2023

Our efforts to increase the ratio of green assets to energy and chemical assets will continue also in 2023 through the innovation of our business portfolio. In battery and materials, we will focus on profitability through qualitative growth, in addition to overseas investments in the US, Europe, and China. In energy and chemical, the Carbon to Green strategy will stay as the central pillar: Plastic recycling will kick off in earnest. We will construct infrastructure for the energy solution and mobility business utilizing our gas stations nationwide and attract more potential customers. We will also build capacity for the liquid-based heat management business. These activities will be accompanied by our continuous endeavors to redefine SK Innovation as the global supplier of green energy and materials with a diversified business portfolio: Develop specific business plans aligned with technologies invested in by SK Innovation, such as SMR, ammonia, etc., and secure capability to develop unique business models based on green technology.



In 2022, SK Innovation declared the Carbon to Green strategy to realize its financial story, following the future outlook and stakeholders' expectations. Under this strategy, we have created a range of strategic results in Green Anchoring and Green Transformation.

### Activities and Achievements in 2022

#### Our Commitment



SK Innovation will create a "new green portfolio" by supplying clean energy for electrification and building a recycling value chain to expand business.

- the business strategy meeting at CES 2023

Vice Chairman Kim Jun, SK Innovation



#### Achievement 1 Green Anchoring

##### Battery and Materials Business

SK On has been continuously growing its battery business as a key driver of the green business portfolio the company targets to expand. SK On produces batteries for electric vehicles and energy storage systems (ESSs), and offers Battery as a Service (BaaS). Leveraging its unique technologies in high-energy density and high-performance batteries, the company supplies batteries across the globe including the US, Europe and China, while continuously expanding its production capacity. SK On secured annual battery production capacity of 77GWh at the end of 2022. It plans to secure production capacity of 220GWh by 2025 to keep up with customer demands. The company's order backlog is worth approximately KRW 290 trillion won as of the end-of 2022. By upgrading stability in supply and price competitiveness by the establishment of local production facilities as well as strategic partnerships with customers, SK On is securing a stable order volume, while consistently creating opportunities to win new orders. In addition, the company has proven the value and the growth potential of its battery business as a future business by successfully raising funds through green financing for three consecutive years.

SK IE Technology has developed a proprietary technology to produce lithium-ion battery separators, a key material for manufacturing EV batteries. With the construction of production plants in China and Europe,

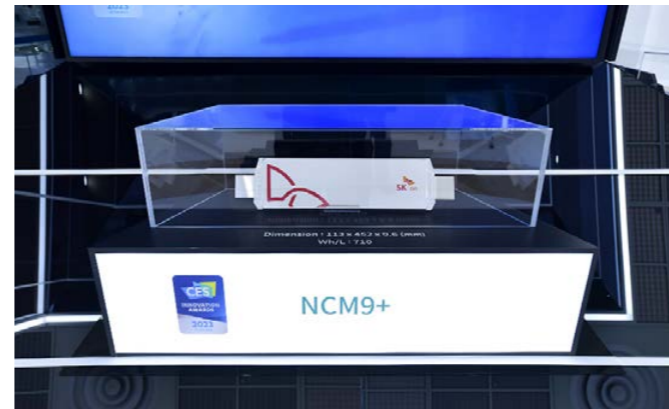
the company has turned itself into one of the top-tier companies in the industry with global production and supply systems. SK IE Technology is adding capacity to its production facilities not only in Korea and China but also in Śląskie, Poland to handle the growing demands. Plant #1 started up in Poland in September 2019 and plants #2 and #3 will come on stream by 2024. With these capacity additions, the company plans to expand its production capacity of lithium-ion battery separators from 1.53 billion m<sup>2</sup> in 2022 to 2.7 billion m<sup>2</sup> by 2024 and consolidate its market leadership. Furthermore, we will lead the supply of high-quality lithium-ion battery separators and pursue new, green materials businesses, thus becoming a green materials solution provider.

#### Sales of Green Businesses\*

(Unit: KRW 1,000)

Category	2020	2021	2022
SKON	-	1,063,926,332	7,617,770,218
SKIET	469,309,226	603,767,421	585,798,633
<b>Total</b>	<b>469,309,226</b>	<b>1,667,693,753</b>	<b>8,203,568,851</b>

\* Sales of the battery and materials business (SK On was established on October 1, 2021)



SK On developed the world's first NCM9+ battery with a nickel content higher than 90%

#### Achievement 2 Green Transformation

##### Plastic Recycling and High-Performance Materials Development

SK Geo Centric is setting the foundation for a recycling business and expanding the scale of its recycling materials business to become a global top-tier supplier of recycled materials. The company is working with several partner firms to construct an advanced recycling cluster (ARC) in Ulsan by 2025 and secured three leading technologies for advanced recycling such as pyrolysis, PET depolymerization, and high-purity polypropylene extraction. We also developed a post-treatment technology for pyrolysis oil.

We are looking to partner with waste collecting/sorting agencies to secure a stable supply of waste plastic for recycling and to build a closed loop together with domestic/overseas brands. In 2023, the company plans to start ARC EPC to internalize the three recycling technologies we have secured and kick off recycling projects, such as launching a global partnership with collecting/sorting firms, in earnest. In high-performance materials recognized for their environmental improvement effects, we are pushing to enter the Asian market by securing technology through a joint venture for EAA production with Weixing Chemical. SK Primacor Europe started the commercial operation of Ionomer #1 and adopted renewable naphtha to expand the production and sales of bio-products.

#### Advanced Recycling of Plastic

Advanced recycling uses pyrolysis, depolymerization, etc. to recycle waste plastic by chemical reactions, not mechanical methods, and is believed to have strong growth potential as a fundamental solution to waste plastic issues. As opposed to mechanical recycling (waste plastic is crushed, washed, and melted by machines), waste plastic recycled by CR offers as good quality as new plastic and can be repeatedly recycled.

#### Specific Technology Components

- Recycling of waste plastic (polypropylene)
- Raw materials and naphtha extraction from waste plastic through pyrolysis
- Depolymerization to turn waste plastic to basic raw materials

### Low-Carbon Platform Business

SK Energy has strived to secure expertise and key technologies so that it can transform its business model into a low-carbon energy solution and mobility platform business and is currently focusing on laying a foundation for this business through the efficient improvement of policies, regulations, and systems. In 2022, the company successfully ran fuel cell demonstration projects at Pakmi/Gaenari gas stations and was able to induce an agreement on the improvement of government regulations. Starting in 2023, we are planning to conduct the fuel cell business at our gas stations in Seoul and the capital area, and idle lands owned by the government, and start to build low-carbon energy production hubs in earnest. We secured core technology for this low-carbon mobility business by investing in Atom Power, a US company with power semiconductor-based medium/slow EV charging solutions and will preemptively construct EV-charging infrastructure to expand service coverage.

### Key investments in environmental technologies and businesses

OC	Investment	Period	Description	Amount	Expected benefits
SKI	Equity investment in Terra Power	'22	Equity investment in a Next-Generation SMR design company (Terra Power, US) in joint with SK Inc.	\$150M (\$250M including SK inc)	Secure business opportunities related to reliable carbon-free electricity
SKI	Equity investment in Amogy	'22-'23 (1H)	Equity investment in an ammonia fuel cell company (Amogy)	\$80M	Find and expand commercialization opportunities for direct-use ammonia
SKEN	Equity investment in GRC	'22	Equity investment in immersion cooling technology developer (GRC, US)	\$25M	Start thermal management business to execute financial story
SKE	Acquisition of Atom Power	'22	Acquisition of an energy solution provider (Atom Power, US) in joint with SK Inc.	\$78M (\$157M including SK inc.)	Enter the EV charging solution market in the US by acquiring Atom Power, an integrated HW & SW solution for EV charging.
SKI	Equity investment in Airrane	1H, '23	Equity investment in a CO <sub>2</sub> separator membrane developer (Airrane, Korea)	TBA	Raise competitiveness in CCUS carbon reduction with joint technology development

### Major investment plans in environmental technologies and businesses

(Unit: KRW 100 million)

Business and Investment	Investment			
	2023	2024	2025	2026
Secure technologies and develop businesses for supplying future energies (i.e. hydrogen, ammonia)	1,050	900	1,000	2,500
Promote a circular economy with investments in domestic waste gasification technology for bioenergy production	130	2,000	600	600
Secure technologies and develop businesses relating to carbon capture and storage	310	600	600	500

### Investment in Immersion Cooling Technology

Investment in Immersion Cooling Technology In 2022, SK Enmove made an equity investment of \$25 million in GRC, a US company that has core technology and patents for the immersion cooling of servers at data centers. Immersion cooling refers to a technique of submerging data servers in a thermally conductive immersion cooling fluid, which consumes less electricity than air cooling and contributes to global efforts for carbon reduction. SK Enmove and GRC are collaborating to develop jointly an immersion cooling fluid and an immersion cooling system for data centers using high-quality lubricant and will make fast moves on their standardization and commercialization. This data center project will become a bridgehead from which SK Enmove will develop a future business using its premium lubricant as an immersion cooling fluid and become a liquid-based heat control solution provider. We are also considering starting an immersion cooling business for EV batteries as there is growing demands for better fire safety and performance of EV batteries amid the fast growth of the EV market. The company will also find other ways to expand its heat management business to deal with diverse shifts of paradigms and pick up the pace in the green.

### Achievement 3 New & New

### Future Energy Portfolio of SK Innovation

In pursuit of innovating its business portfolio, SK Innovation has been on a constant search for new business items. We chose “electrification” and “recycling” as the two focus areas of the future energy business, and have been making seed investments to secure technology prowess aligned with our portfolio development strategy. In August 2022, the company and SK Inc. made a joint investment of \$250 million in TerraPower, a US-based company with Next-Generation technology for small module reactors (SMR), expected to serve as carbon-free power suppliers. Also in June 2022, we made a preemptive move to build the foundation for the hydrogen and ammonia business and to occupy the end-use market, by investing \$30 million in Amogy, a US company with ammonia-based fuel cell technology. \$50 million was additionally invested in Amogy in March 2023 for the purpose of creating an ammonia ecosystem and strengthening strategic partnerships. In July 2022, we invested \$20 million in Fulcrum, a US company with waste-to-gas technology in a bid to enter the waste-to-energy market. In May 2023, the company made a joint equity investment with SK IE Technology in Airrane, a Korean company with membrane technologies to separate and capture CO<sub>2</sub>, and we are currently developing Next-Generation separators with Airrane. Going forward, SK Innovation will strive to seize various business opportunities through seed investments in new, green technologies, while at the same time secure competitiveness in the existing businesses and building partnerships at a faster pace.



Learn more about [Expansion of the Green Portfolio](#).