The background features two large, overlapping wavy lines. The top line is a gradient of purple and blue, curving from the top left towards the right. The bottom line is a gradient of blue and cyan, curving from the bottom left towards the right. The text is centered in the middle of the slide.

Introduction of the development and diffusion of carbon neutral technologies utilizing intellectual property

November 29, 2022

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01

Introduction of LG Chem

LG Chem | History

Since its founding, LG Chem is vigorously moving forward towards a sustainable future.



1947 - 1999

- 1947** Established as Lucky Chemical Industrial Corporation
- 1969** Listed on Korea Stock Exchange
- 1974** Renamed as Lucky Corporation
- 1976** Completed construction of Yeosu PVC Resin Plant
- 1979** Opened Daedeok Central R&D Center
- 1991** Developed the world's first 4th-generation cephalosporin antibiotics
- 1995** Renamed as LG Chem, Ltd.
Completed construction of Tianjin PVC plant in China

2000 - 2009

- 2001** Spinned off business entities (LGCI, LG Chem, LG Household & Healthcare)
- 2003** Acquired Hyundai Petrochemicals
Factive became first Korean new drug to receive U.S. FDA approval
- 2004** Developed the world's first nanotechnology-applied new EP material
- 2005** Established LG Chem (China) Investment Co., Ltd.
Established a sales subsidiary in Europe (in Germany)
- 2007** Merged with LG Petrochemicals Co., Ltd
- 2008** Developed Korea's first metallocene-based elastomer
- 2009** Spinned off Industrial Materials Business (now LX Hausys)

2010 - 2021

- 2016** Acquired Dongbu Farm Hannong (Farm Hannong)
- 2017** Merged with LG Life Sciences Co., Ltd.
- 2019** Completed construction of Korea's largest petrochemical tech center (in Osan)
Opened the Global Innovation Center in the bio sector (in Boston)
Spinned-off battery business (now LG Energy Solution)
- 2020** Acquired separator business
- 2021** Started construction of Cathode Material Plant for Gumi-type jobs (LG BCM)

LG Chem | Financial Results

* Included Subsidiaries



Sales in 2021

USD **37.3bn**

(Approx.)



Workforce

18,800 (Person)

Domestic 13,920

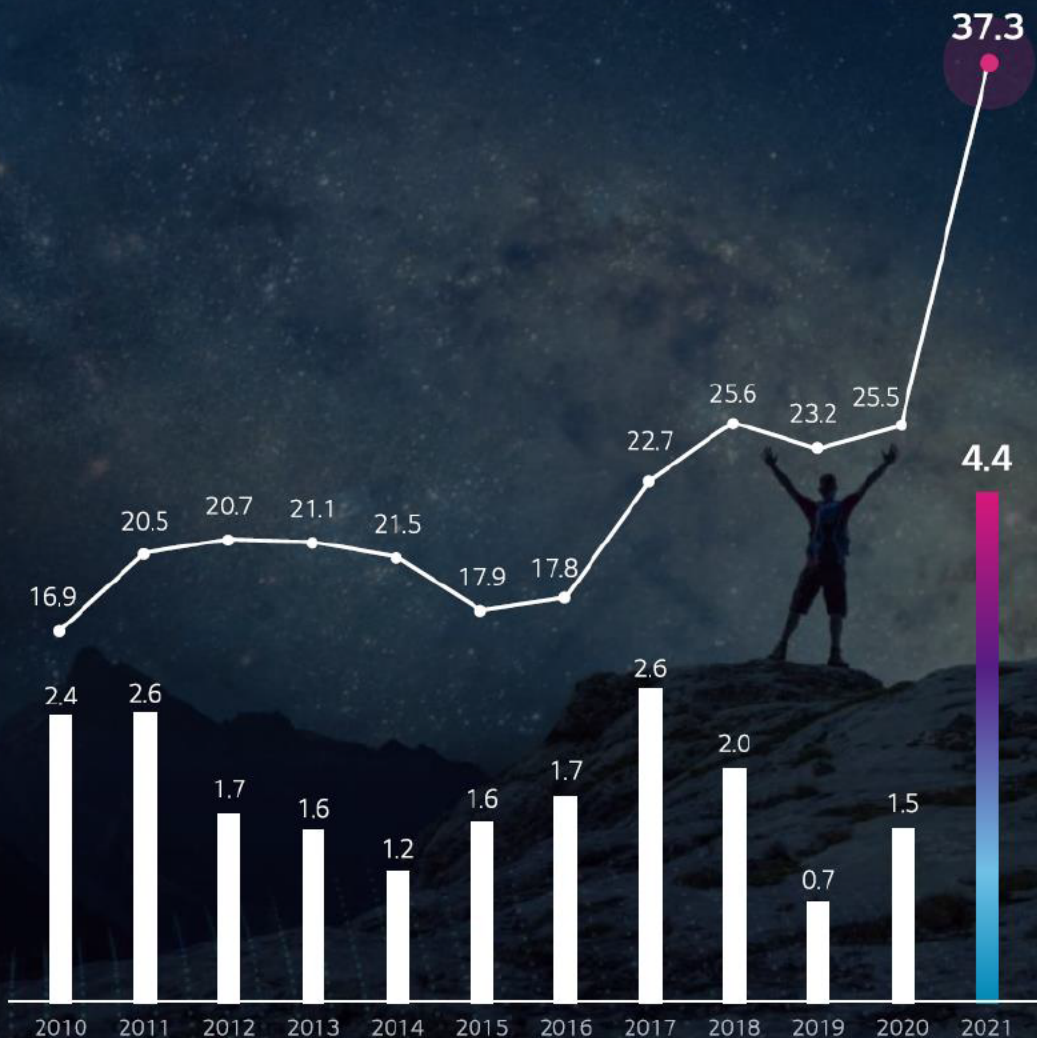
Overseas 4,880
(Approx.)

Sales

(Unit : Billion USD)

Operating profit

(Unit : Billion USD)



LG Chem | Business Area



Petrochemicals

- NCC
- Polyolefins
- PVC/Plasticizers
- ABS
- Acrylates/SAP
- HPM(High Performance Materials)
- Catalyst
- CNT



Advanced Materials

- Battery Separator
- Cathode Materials
- Engineering Material
- IT Materials
- Semiconductor Materials
- RO Filter



Life Sciences

- Primary Care
- Specialty Care
- Aesthetic

Proportion of Petrochemical Business in LG Chem's Sales

■ Petrochemicals ■ Other



Leading Business Sustainability with Eco-Friendly Materials

Promoting bio materials, recycling, and energy transition as future growth engines



Bio Materials

- About 40 bio products certified by ISCC Plus
- World's first mass production of bio-balanced SAP
- Internalize bio materials production, strengthen partnerships for development



Establish circular economy of waste plastics

- Produce PCR products
- Partner with waste plastic suppliers
- Establish an eco platform



Discover new renewable energy materials

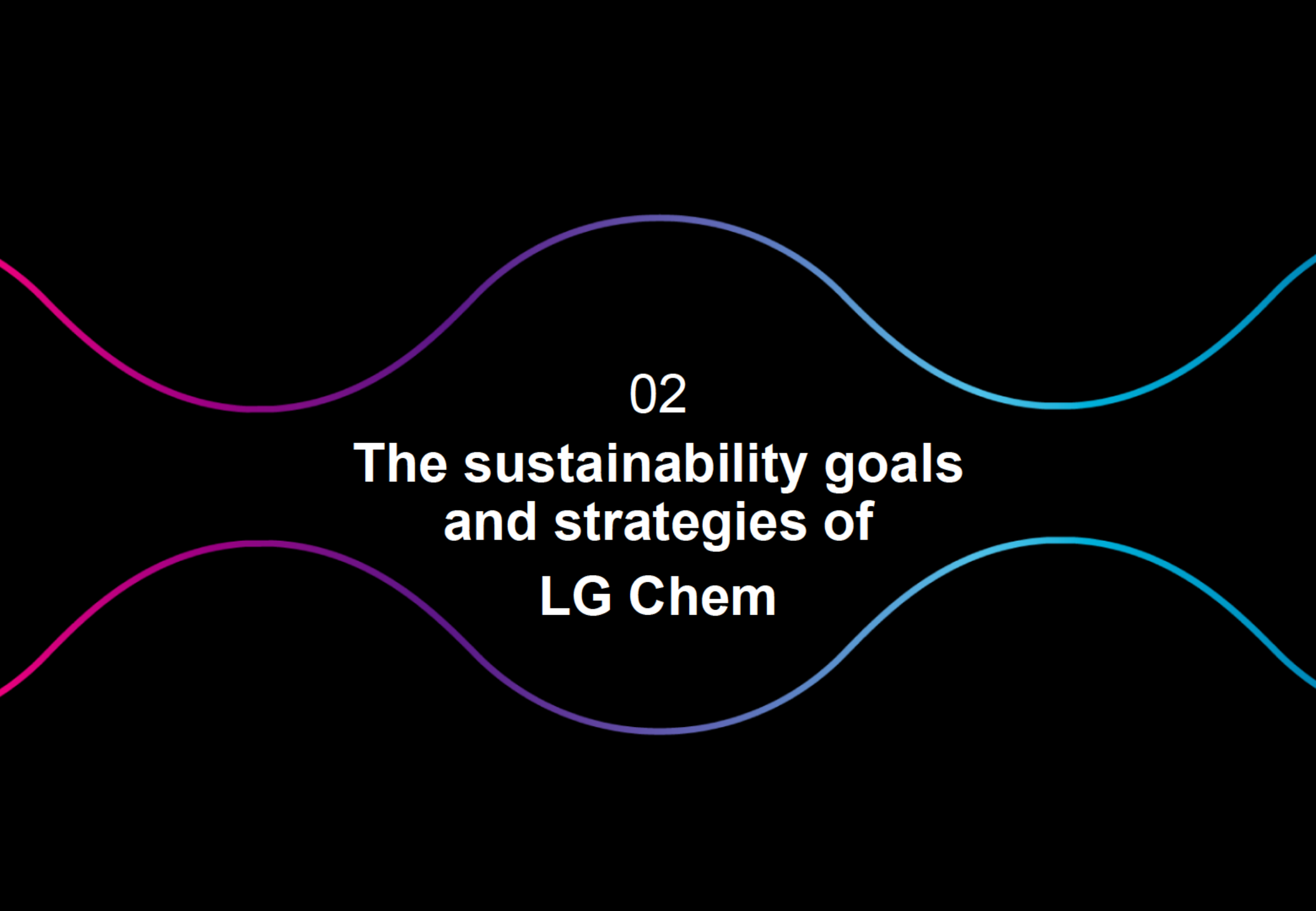
- Produce high value-added products for solar panels
- POE, EVA, EP

To achieve our vision, **"We Connect Science to Life for a Better Future,"**
LG Chem will become **Top Global Science Company** that leads with **Science for Sustainability.**

WeConnect**Science** to life for a Better Future



Leading with Science for Sustainability.

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02

**The sustainability goals
and strategies of
LG Chem**

LG Chem Sustainability Goals

We do Everything for Sustainable Growth



Carbon Neutral Growth by 2030 & Net-Zero by 2050



Renewable Energy 100% by 2050



Transition towards Circular Economy



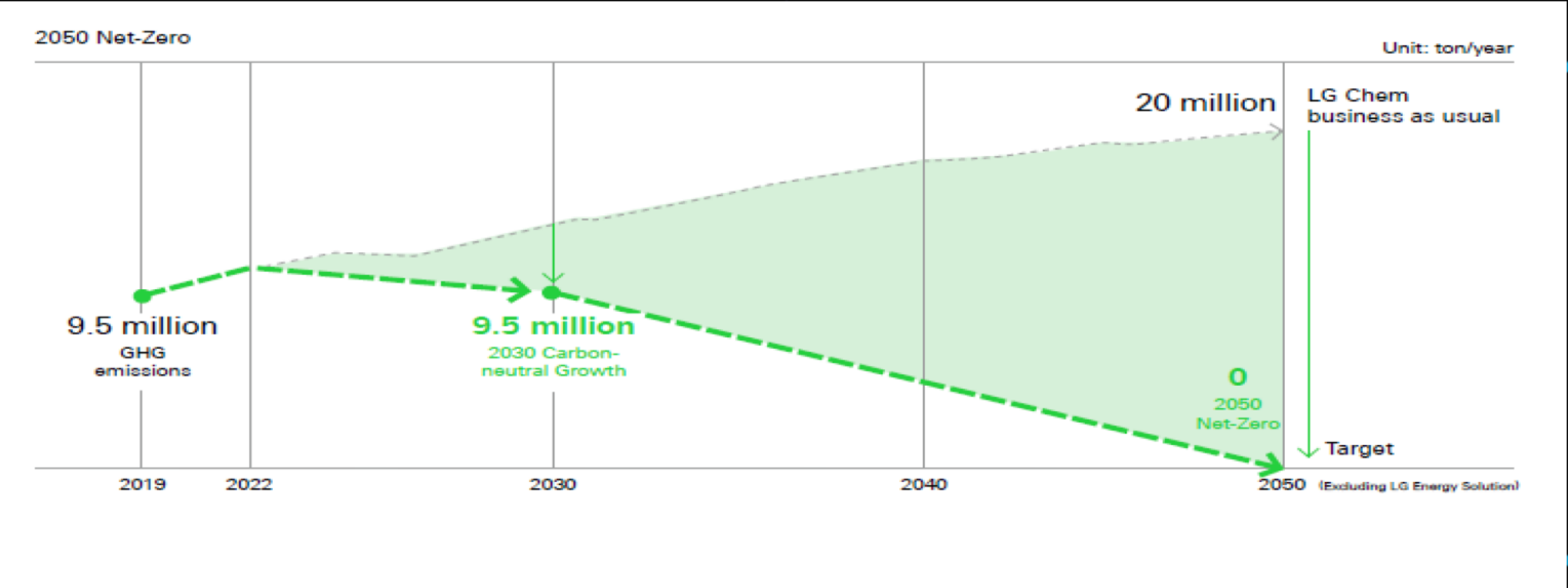
Zero Waste to Landfill



Ethical and Sustainable supply chain

Our commitments to reaching the Paris Climate Agreement

We intend to achieve net-zero by 2050 according to our strategy of Reduce (direct emissions), Avoid (indirect emissions), and Compensate (carbon offset).



Following the formulation of our sustainability strategy in 2020, LG Chem was the first chemical company to declare carbon-neutral growth by 2050 in Korea. Since then, we have established detailed, company-wide objectives and strategies based on our strong will and have undertaken various activities to reduce carbon emissions. As a result, we have set a higher target for reducing carbon emissions, “2050 Net-Zero,” in early 2022.

Reduce (Direct Emissions)

LG Chem is making efforts to reduce direct emissions from our business sites, as well as adopt innovative processes and switch to low-carbon fuels and raw materials.

Cutting carbon through innovation

Green fuel transition

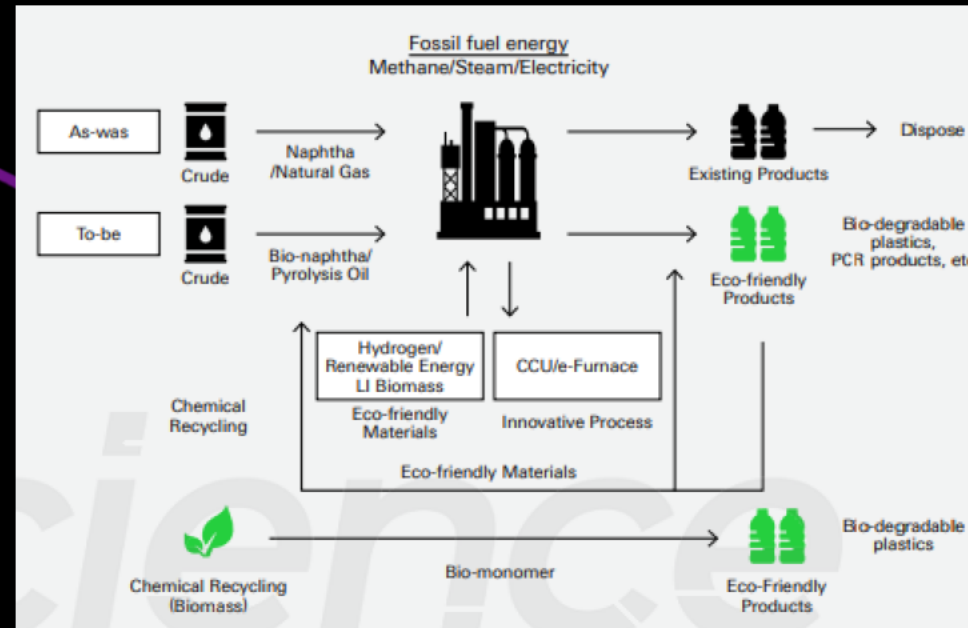
Carbon capture and utilization (CCU)

International cooperation for carbon-neutral technology commercialization

A transition to low-carbon materials

Recycled materials

Bio materials



Avoid (Indirect Emissions)

We declared our commitment to source 100% renewable energy such as wind and solar power by 2050. We are striving to shift the energy of our global business sites toward renewable energy.

• Renewable energy procurement

1) Green Pricing: A scheme of charging a premium on electric bills to cover the use of electricity powered by renewable energy resources. LG Chem has completed the conversion to the renewable energy at our Yeosu nitrile butadiene rubber (NBR) plant and Osan Tech Center through the Green Pricing.

```
graph LR; KEPCO[한국전력공사 KEPCO] -- Electricity --> Corporate[Corporate]; Corporate -- Premium Payment --> KEPCO
```

2) Renewable energy certificates (RECs): We accomplished 100% renewable energy at the LGES battery plant in Michigan by acquiring RECs and adopting a mechanism that allows us to gain credit for using renewable energy while using general electricity through REC purchases.

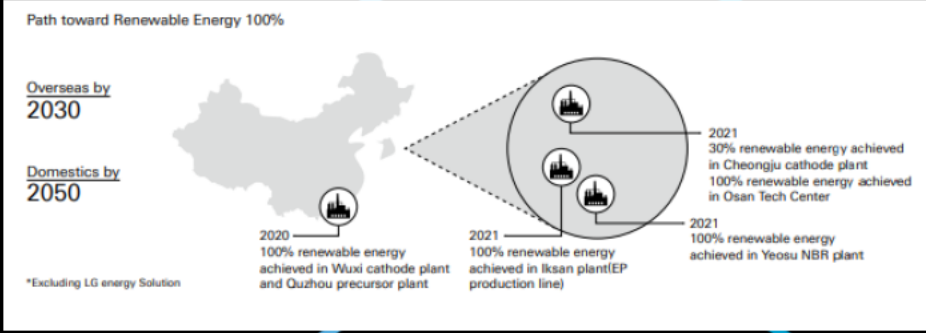
```
graph LR; EG[Electricity Generator] -- Trading Platform --> Corporate[Corporate]
```

3) Power purchase agreement (PPA): A PPA is a contract in which a business agrees to purchase electricity and a certificate directly from a renewable energy provider. Through PPA, our battery plants in Wuxi (Jiangsu province) and Quzhou (Zhejiang province) have achieved renewable energy 100%.

```
graph LR; EG[Electricity Generator] -- Contract --> GO[Grid Operator]; GO -- Contract --> Corporate[Corporate]
```

4) Directly generating renewable energy and investing in equities: LG Chem is considering the equity investment in renewable energy businesses in partnership with Korean and overseas renewable energy providers. We signed an MOU for the “joint response to accomplish 100% renewable energy” with Korea South-East Power Co. (KOEN).

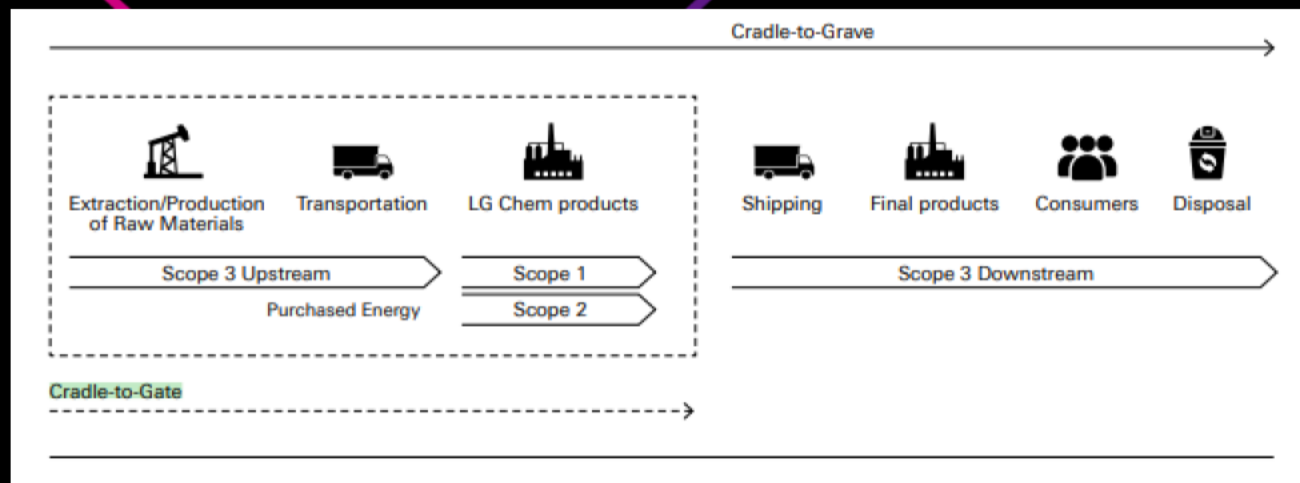
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graph LR; Corporate[Corporate] -- Equity Investment/ Direct Installation --> EG[Electricity Generator]
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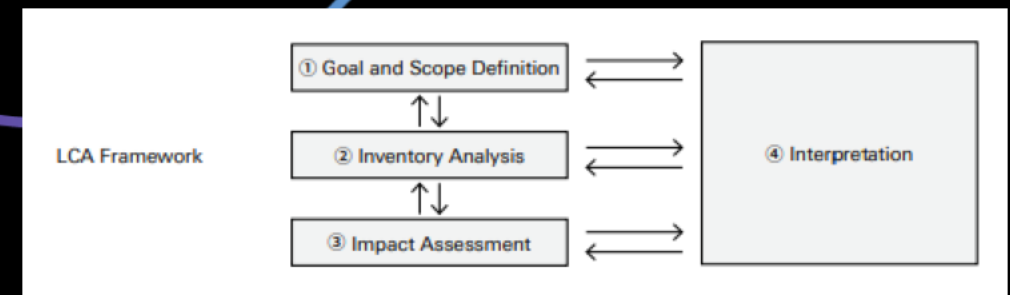
LCA (Life Cycle Assessment)

LCA is a method used to evaluate a product's environmental impact throughout its life cycle including extraction and production of raw materials, manufacturing, distribution, use, and final disposal.

We plan to complete LCA for all products manufactured in Korea by 2022, and oversea by 2023.



We define our system boundary as “Cradle-to-Gate,” which include Scope 3 (Upstream). After setting up the LCA baseline, we plan to investigate the environmental hotspots and develop reduction strategies and action plans.



2021-2022 Highlights

41 bio-balanced products

To enhance the competitive edge of our green products, we acquired International Sustainability and Carbon Certification (ISCC) PLUS certifications for the first time in Korea for a total of 41 "bio-balanced" products that are made up of bio materials.

KRW 2.6 trillion

As part of our goal to invest a total of KRW 2.6 trillion by 2028, we are committed to developing a PBAT production unit with an annual capacity of 50,000 tons and building a total of 10 plants, including a POE plant for solar films.

100%



Shift to renewable energy is one of the key strategies to attain net-zero. We successfully transitioned all battery materials plant in China to 100% renewable energy through direct power purchase agreements (PPAs).

KRW 292.7 billion

To strengthen environment, health and safety (EH&S), we invested KRW 292.7 billion in 2021, a 62.3% rise YoY.

KRW 10 trillion



To transition our business portfolio toward sustainable growth, we plan to invest KRW 10 trillion by 2026 in our three next growth engines—sustainable & eco-friendly materials, battery materials, innovative new drugs

20,000 tons

To advance into the chemical recycling business for the construction of a plastic circulation system, we plan to complete the construction of a supercritical pyrolysis plant with an annual capacity of 20,000 tons by 2024, which allows us to recycle more than 80% of raw materials input.

20,000 tons of nickel

Together with LG Energy Solution, our subsidiary, we signed a ten-year contract with Li-Cycle, North America's largest lithium-ion battery recycling company, for scraps and nickel supply starting in 2023. We have secured 20,000 tons of nickel enough to manufacture 300,000 high-performance electric vehicles (EVs).

180GWh

LG Chem is the first in Korea to sign a 20-year contract to purchase renewable energy certificates (RECs). By 2041, we will have secured an average of 9 GWh of renewable energy per year, totaling 180 GWh.

75,000 tons

In partnership with the Archer-Daniels-Midland Company, a global grain processing corporation, we aim to devise an integrated production system, from lactic acids (LA; the raw material) to polylactic acids (PLA; bioplastics), by building a PLA production plant with an annual capacity of 75,000 tons.

20 million tons



To meet our new, raised goal of achieving net-zero by 2050 as declared at 2022 Investor Day, we must reduce 20 million tons of total carbon emissions from BAU in 2050.

29% of BOD



LG Chem operates BOD-centered management system. We launched the ESG Committee in 2021, and appointed two female outside directors the following year, reaching 29% of a female presentation on the BOD. We intend to continuously expand board diversity in our future operations.

ESG Performance Data

Environment

Greenhouse Gas Emissions

| | Unit | Scope | 2019 | 2020 | 2021 |
|---|--------------|-------------|-----------|-----------|------------|
| GHG Emissions (Scope 1 + Scope 2) | tCO2e | Global | 9,510,011 | 9,532,948 | 10,339,725 |
| | | Korea | 8,140,033 | 8,071,712 | 8,841,025 |
| | | excl. Korea | 1,369,978 | 1,461,236 | 1,498,700 |
| GHG Emissions Intensity (Scope 1 + Scope 2) | tCO2e/KRW 1M | Global | 0.5187 | 0.5536 | 0.4296 |
| Scope 1 Emissions | tCO2e | Global | 5,405,608 | 5,395,112 | 5,856,588 |
| | | Korea | 5,260,041 | 5,199,836 | 5,707,208 |
| | | excl. Korea | 145,567 | 195,276 | 149,380 |
| Scope 1 Emissions Intensity | tCO2e/KRW 1M | Global | 0.2948 | 0.3133 | 0.2433 |
| Scope 2 Emissions | tCO2e | Global | 4,104,403 | 4,137,836 | 4,483,137 |
| | | Korea | 2,879,992 | 2,871,876 | 3,133,817 |
| | | excl. Korea | 1,224,411 | 1,265,960 | 1,349,320 |
| Scope 2 Emissions Intensity | tCO2e/KRW 1M | Global | 0.2238 | 0.2403 | 0.1863 |
| Scope 3 Emissions ¹⁾ | tCO2e | Korea | 1,081,852 | 1,209,828 | 1,320,247 |
| - Purchased Goods & Services | | | 494,538 | 517,985 | 571,164 |
| - Capital Goods | | | 54 | 14 | 56 |
| - Fuel- and Energy-related Activities | | | 122,922 | 121,904 | 175,732 |
| - Upstream Transportation | | | 151,406 | 318,438 | 197,919 |
| - Waste | | | 19,113 | 19,679 | 28,925 |
| - Business Travel | | | 2,767 | 2,265 | 970 |
| - Employee Commuting | | | 7,987 | 4,737 | 7,488 |
| - Investments | | | 276,686 | 219,190 | 322,438 |
| - Other Upstream | | | 6,379 | 5,616 | 15,555 |

1) Scope 3 emissions have been calculated for operations within Korea, on relevant categories of GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)

* Scope 1 and Scope 2 emissions in Korea in 2020 have been revised in accordance with the verification outcomes of the Ministry of Environment

* Scope 1 and Scope 2 emissions in Korea in 2021 have been reported in accordance with the GHG Statements submitted to the Ministry of Environment; the data is subject to change depending on the verification outcomes

* Emissions calculations for some Scope 3 categories have been adjusted based on updated methodology

Carbon-neutral growth by 2030, Net-Zero by 2050



Accelerate decarbonization

Introduce innovative processes and convert to eco-friendly raw materials and fuels

Expand use of renewable energy

Offset carbon emissions



Strengthen competitiveness of low-carbon products through LCA

To be applied
To all Korean market products in 2022,
all Korean/overseas products in 2023



Become a global leader in climate response

The first and only Asian member of
WEF Alliance of CEO Climate Leaders

*Alliance of CEO Climate Leaders : Climate alliance with over 30 corporate CEOs and government officials worldwide

Towards Top Global Science Company



Sustainable business centered around eco-friendly materials

Develop bio materials

Establish circular economy
of waste plastics

Foster renewable energy material business



Battery material-oriented e-Mobility

Produce first-rate cathode
materials in the world

Expand core material business
for secondary batteries

Reinforce R&D for
next-gen battery materials



World-class innovative drug development

Expand domestic top-level pipelines

Develop global clinical trials
and accelerate business

Bolster investment in R&D
for new drug development

...
Towards Top Global Science Company



Foster bioplastics and low-carbon technology

Mechanical/chemical recycling technologies

Develop and commercialize biodegradable plastics

CO2 capture/utilization technology



**Improve battery performance and safety
Develop next-gen battery materials**

Develop single-crystal cathode materials

Develop new materials for separators /pure silicon electrode materials

Material technology for all-solid-state batteries



Gain leadership in cancer /autoimmune diseases, diabetes /metabolic diseases

Accelerate global clinical development for new drug projects, e. g., gout, NASH, and obesity

Implement multi-modality strategies for cell/gene therapy

* Various approach to drugs

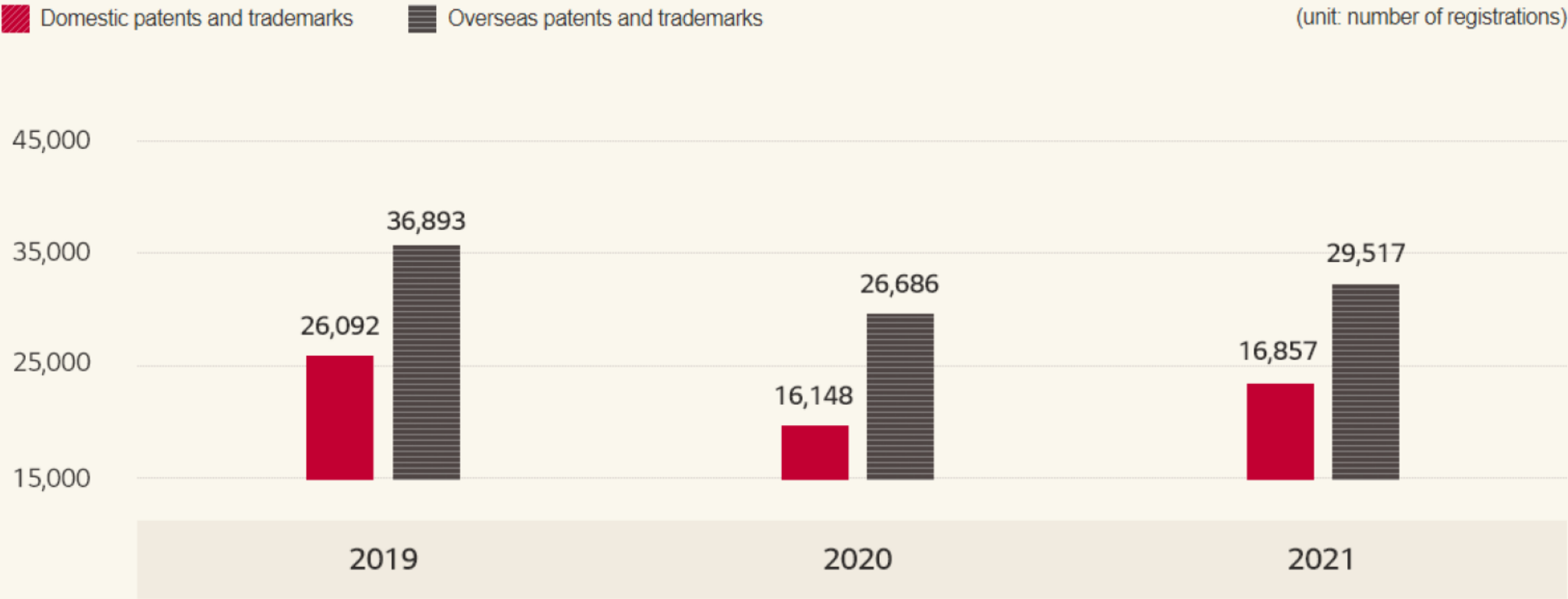
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03

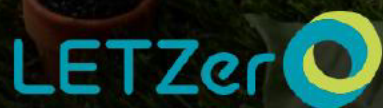
**IP strategies of
LG Chem in carbon
neutral technologies**

Intellectual Properties

LG Chem has accumulated a rich reserve of patents and trademarks through strategic management of intellectual property.



LG Chem | Eco-friendly Brand



Eco-friendly Material Brand LETZero

A compound word of "Let" and "Zero," which means "to turn harmful substances to the environment and the net increase in carbon emissions into zero."

LETZero Product Line

Recycle



PCR ABS

Electrical/electronic products, automobiles, construction materials, etc.



PCR PC, PCR PC/ABS

Electrical/electronic products, automobiles, industrial materials, building materials



PCR PP

Packaging materials, medical instruments



PCR PE

Packaging materials, medical instruments

Bio materials



Bio balanced SAP

Diapers, menstrual pads



Bio balanced NPG

Paint, PET film, coating agents, adhesives, UPR



Bio IPA

Semiconductor/LCD manufacturing detergent, paint, pharmaceuticals, and cosmetics



Bio balanced Acrylates

Paints, adhesives, coating agents

⋮

Biodegradable



PLA

Packaging materials, film, 3d printing



PLH

Disposable bags and gloves



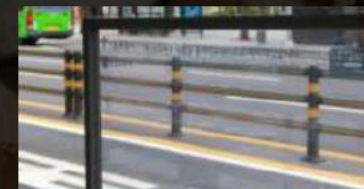
PBAT

Agricultural film, packaging materials

LETZero Certification



Royal Botanic Toothpaste by LG Household & Health Care with LETZero Certification



Bus stop built with PCR materials

Capacity building

Systematic intellectual property management

We have strengthened the system to establish patent strategies spanning the entire corporation, from R&D activities to business operations.

Step-by-step patent management

From early R&D to commercialization, our dedicated IP experts provide focused support to acquire patents and strategize their applications.

Open innovation

We are fostering various open innovations to prepare for the future and tap into exceptional technologies early.



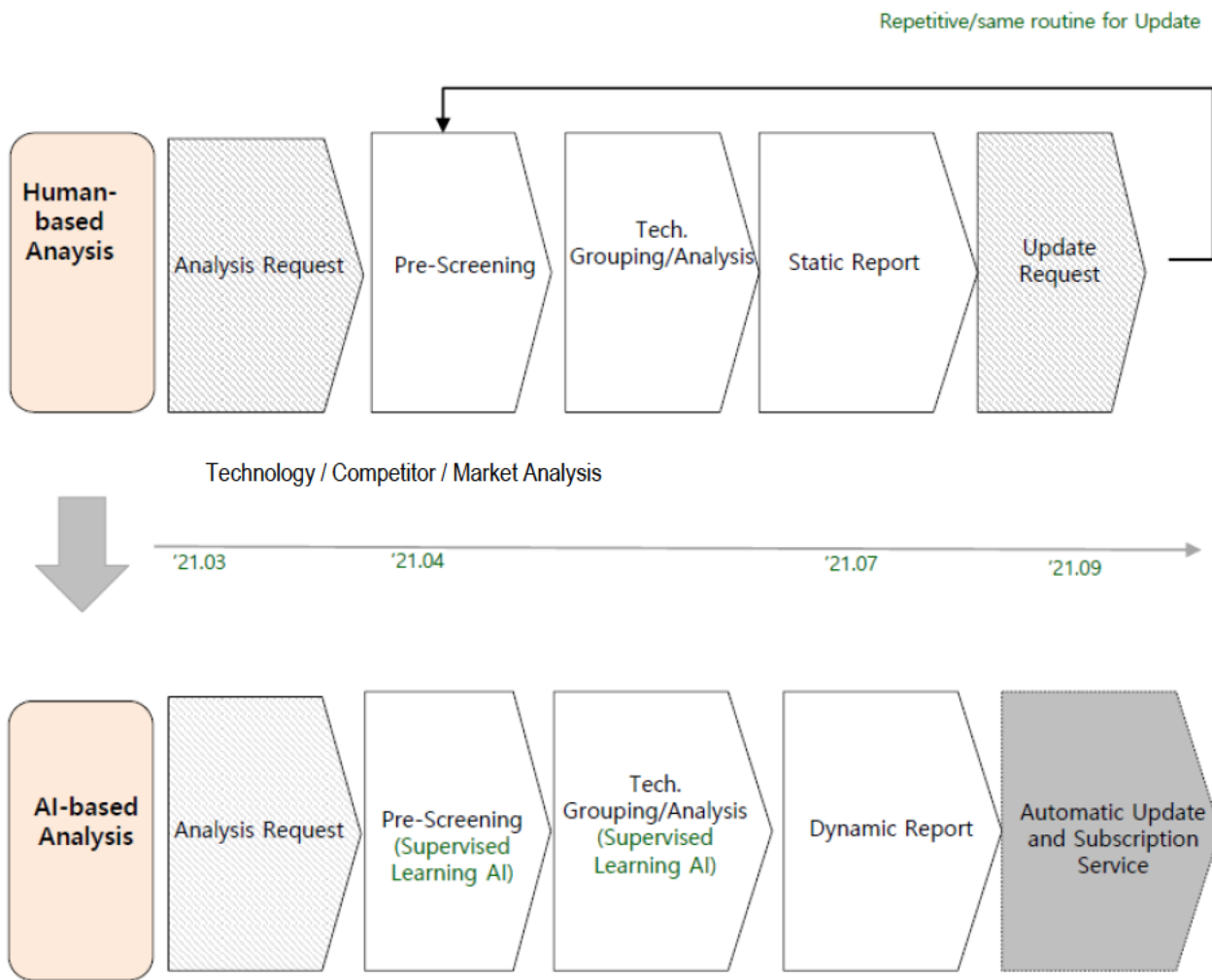
IP-Based Technology Scouting using AI/DX

We analyze statistics on patents using AI/DX and use it to establish application/license strategies, set R&D directions, and support new businesses to secure competitive advantage and strengthen our portfolio.

Technology Scouting

- Step 1: Tech trend sensing/forecasting, identify emerging tech
- Step 2: Channel tech related information into the company
- Step 3: Support acquisition of the tech

Use of AI in Statistical Analysis of Patents : Supervised Learning



Patent Competitiveness Analysis Report



Paper-type Report

Patent Competitiveness Analysis Platform



(Daily update)

Use of AI in Statistical Analysis of Patents : Unsupervised Learning

Outline

Automatically clustering patents for technology scouting

- To identify emerging technology / Channel in-house related information / Support acquisition of the technology

From tech sensing to data-based decision

- Similarity analysis, periodical change in Keywords, etc.
- Enhancing functionality and expanding utilization based on user (R&D, Biz unit) needs



Features and expected effects

Unsupervised AI analysis system dramatically reduces the time and cost of patent analysis

- It is predicted that utilization will increase rapidly due to the expansion of the analysis area and ease of use.

In particular, anyone can easily check and analyze the patent landscape in relation to technology sensing

This improves work efficiency and can be used as a decision making tool

- AI performs rapid basic analysis, IP Personnel interprets data and provides Business insight.
- Used for R&D planning, New Business / Item Development, M&A, financial investment, Technology Transfer etc.

Leading with science
to sustain
our valuable life



THANK YOU

*We***Connect***Science*



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