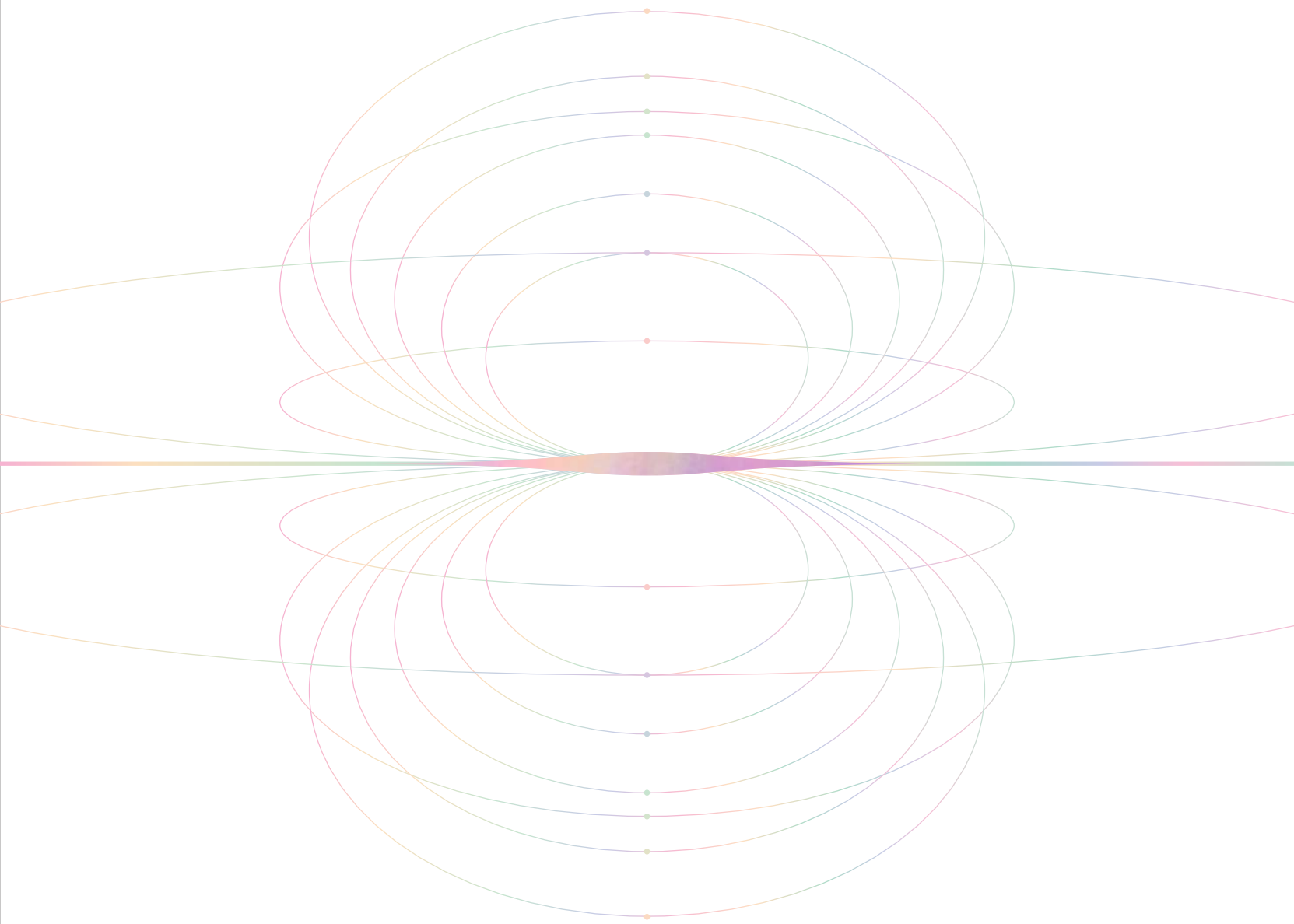
KOREA INSTITUTE OF
INDUSTRIAL
TECHNOLOGY

FROM MANUFACTURING

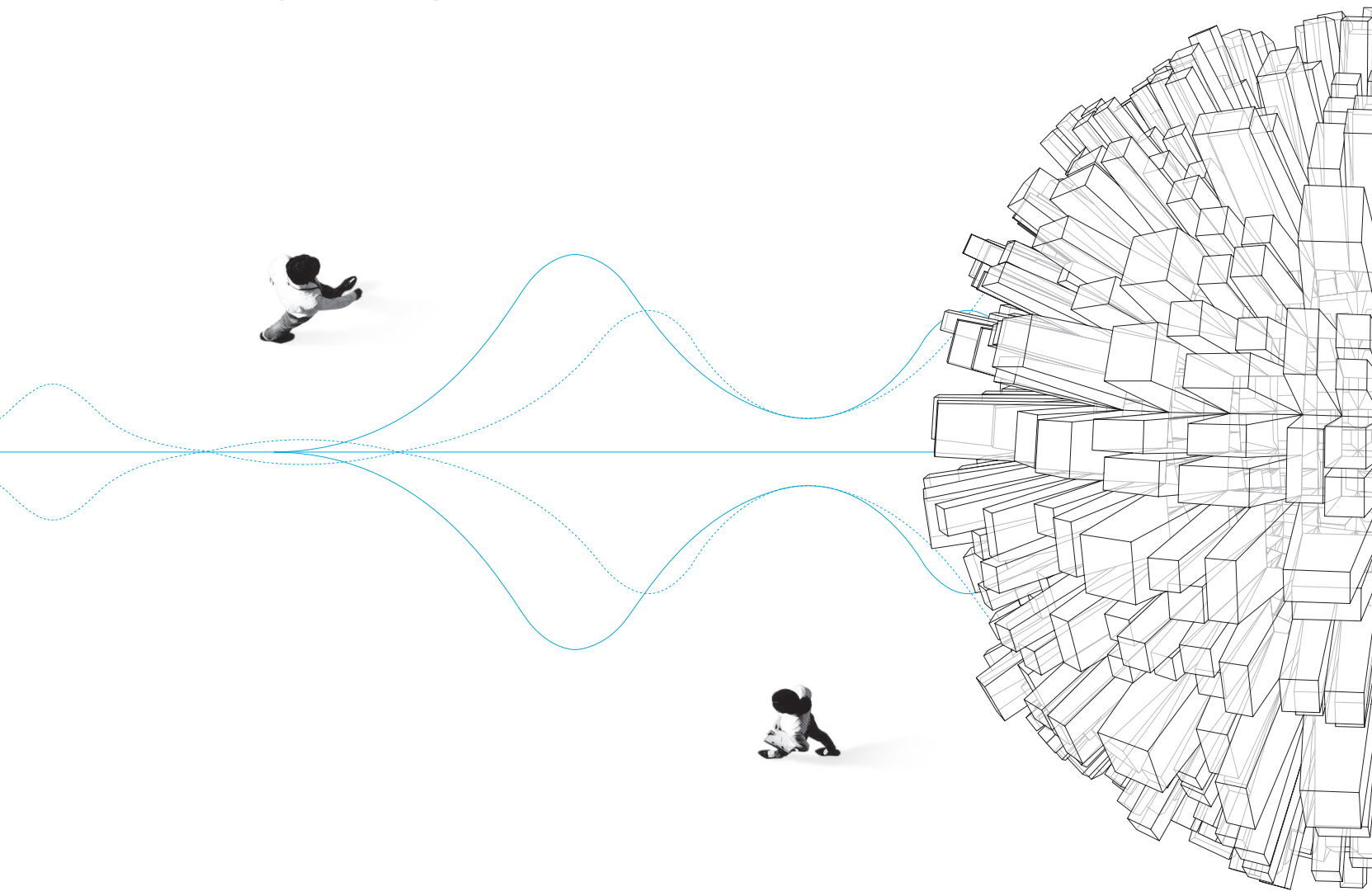


TO VALUFACTURING

KITECH

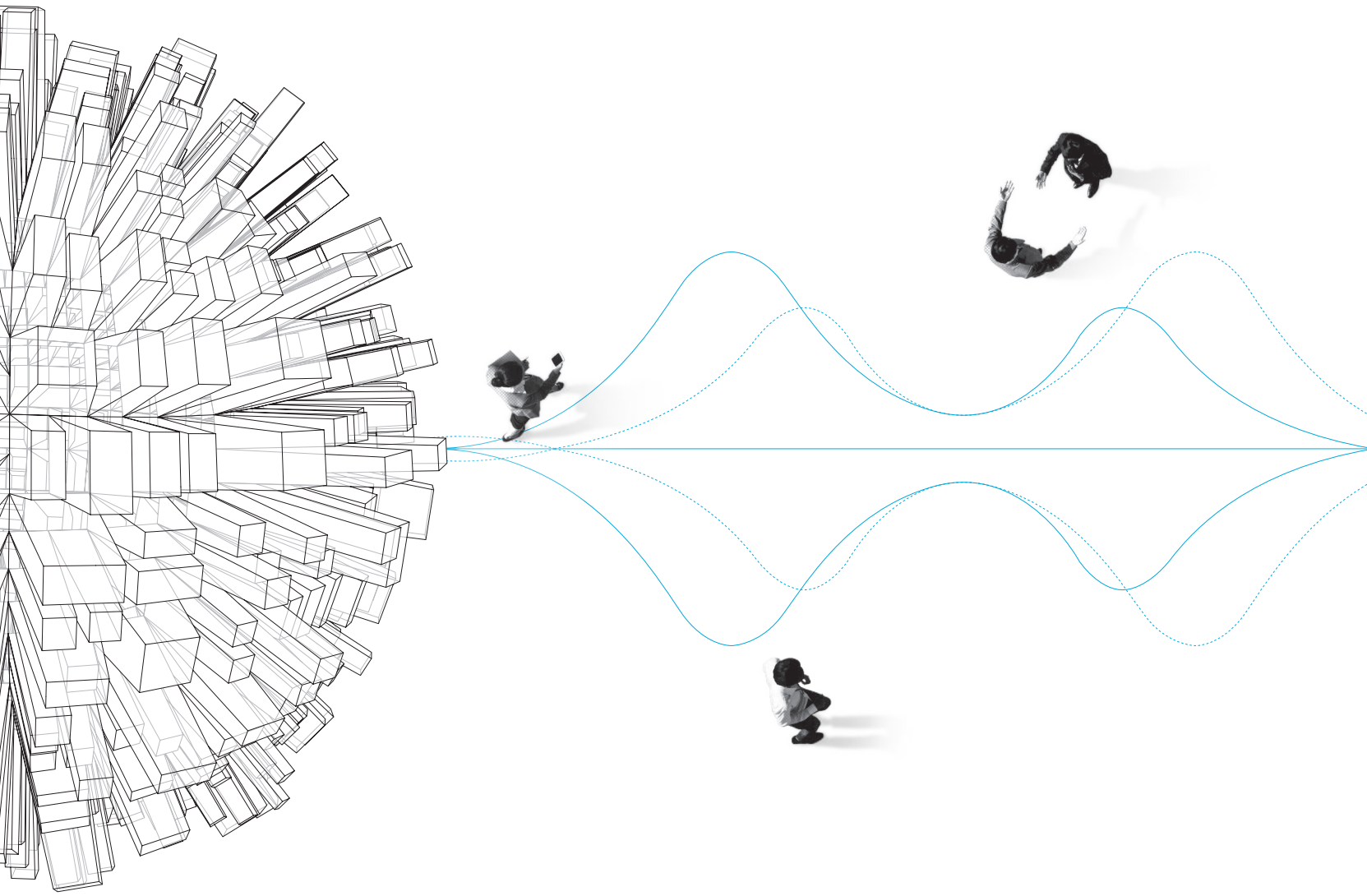
FROM MANUFACTURING TO VALUFACTURING

Climate Change, Demographic Cliff, and the Competition for Technological Hegemony



FROM
MANUFACTURING
TO
VALUFACTURING

What We Need in the Face of a Crisis



INTRO

The Great Transformation in the Manufacturing Technology

FROM
MANUFACTURING
TO
VALUFACTURING

KOREA INSTITUTE OF INDUSTRIAL TECHNOLOGY

PRESIDENT's

KITECH is Preparing for a Major Shift in Manufacturing Technology

President of
Korea Institute of Industrial Technology
Ph.D.

Sang Mok, Lee

MESSAGE

KITECH was established in 1989 to support manufacturing innovation in the domestic industry, focusing on supporting the development and commercialization of manufacturing technology. We have been creating technological resources through the development of manufacturing technology, and charging the growth engine of the industry through enterprise support. We are proud to be a key player of realizing the national R&D policy, driving South Korea to become a manufacturing powerhouse.

However, the domestic manufacturing industry is facing internal and external challenge. As the manufacturing paradigm shifts, R&D and enterprise support method of KITECH is drawing a new manufacturing technology map in duty of supporting manufacturing innovation. We believe it is KITECH's given responsibility to read the huge wave of change in advance and prepare for the future.

The new vision of KITECH is "The Great Transformation of Manufacturing Technology." I believe the role of KITECH, which served as the technology leader in the Industrialized era, must be redefined in line with the future of South Korea as a global leader. We are faced with an urgent task of becoming the master of the world stage where winner-take-all global technology competition is intensifying, and we have to address national and social issues such as climate change, global financial environment change, and demographic change.

In response, KITECH plans to set the "Great Transformation of Manufacturing Technology" as a new vision to mark the 35th anniversary of its establishment and take a big step toward "Manufacturing Industry Value Added Enhancement." The organizational framework and enterprise support method are also being upgrade to match a cooperative shared society from a distributed research base so far to a mega platform research system, and from foundation-oriented enterprise support to a platform that substantially increases corporate profit. We are also upgrading individual and discrete work efforts to methods that can create strategic network synergies.

Based on this, we plan to lead the wave of carbon neutrality and digital transformation to pave the way for a global manufacturing powerhouse, and respond to national and social issues such as local extinction and youth unemployment. In addition, we will strive to raise pride in technology developers and present future hopes to companies and the people by creating core growth engines that enable the domestic manufacturing industry to soar to the world. Thank you.

KITECH's VISION

KITECH is advancing toward
the great transformation in
the manufacturing technology.
Aiming to revitalize domestic industries
facing growth limits,
KITECH drives value enhancement within
the manufacturing sector.
Leveraging its expertise and network,
KITECH is committed to realizing
its new vision.

KITECH 2050 : The Pivot for the Great Transformation

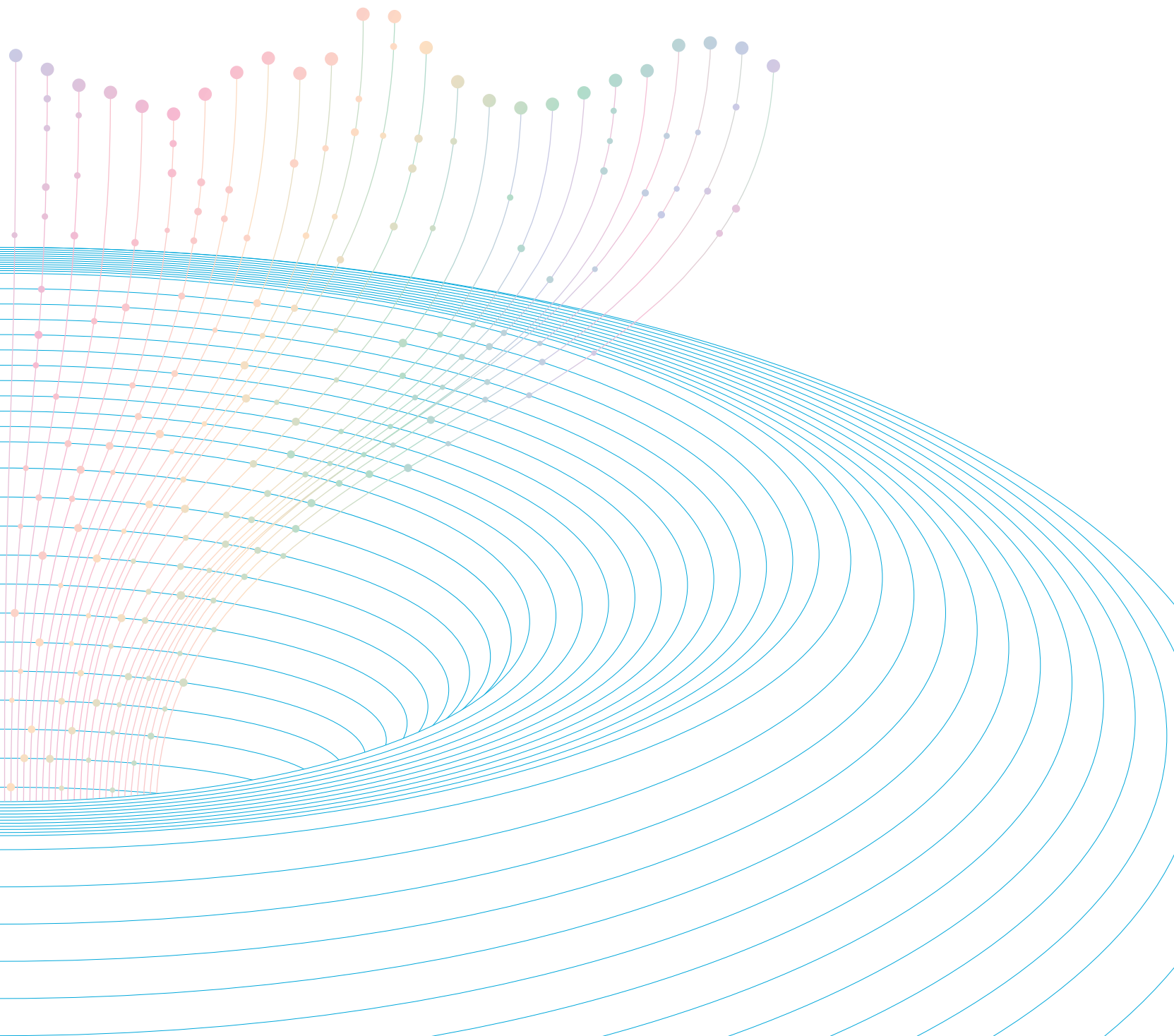
Based on the SMILE manufacturing technology, KITECH fosters high-value, sustainable profitability for companies while invigorating local industries.

CREATE NEW VALUE

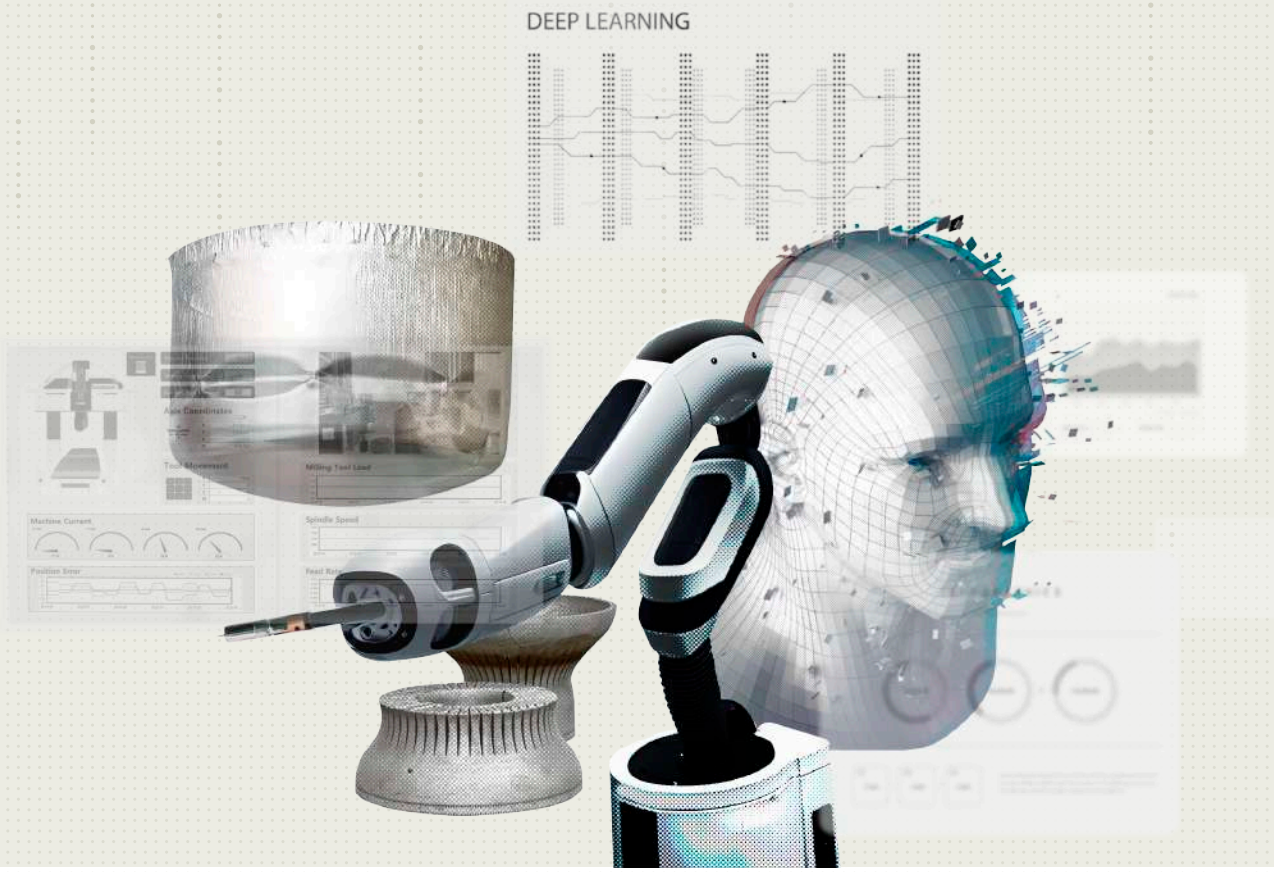
The landscape of the manufacturing technology is evolving.
KITECH is spearheading the creation of new value through:
Establishing an autonomous manufacturing system to enhance customer value, Expanding the manufacturing industry business model to amplify added value,
Contributing to the realization of the hydrogen economy and carbon neutrality.

Part 1

R&D IN
THREE KEY AREAS

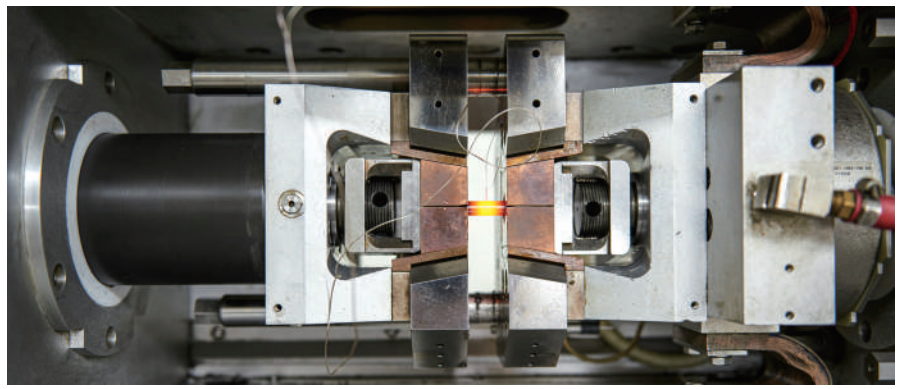


INTELLIGENT MANUFACTURING & MATERIALS TECHNOLOGY



KITECH is proactively responding
to the swiftly changing industrial landscape
and the future manufacturing sector,
which demand profound transformation.

KEY AREAS



Adaptive Manufacturing

Manufacturing technology that responds to changes in the industrial environment of the present and the near future

↘ Supply Chain Driven Technology

Technology designed to swiftly adapt to supply chain fluctuations through advanced process capabilities, enabling rapid crisis mitigation via material substitution and process conversion in times of supply chain disruptions

Technology that gathers and analyzes data across production processes via intelligence technology, enabling visualization of the supply chain and enhancing technological adaptability

↘ Agile Emerging Industry Technology

Technology capable of dynamically addressing the needs of emerging industries like biotechnology, advanced mobility, semiconductors, and displays

Technology which anticipates the technological demands of emerging industries and swiftly responds via digital technology, facilitating rapid commercialization

Flexible Production

Technology for forecasting shifts in forthcoming industries and taking preemptive action

↘ Intelligent System Technology

Utilizing state-of-the-art technologies like artificial intelligence, machine learning, and the Internet of Things to enhance and streamline the production environment, transitioning from centralized manufacturing systems and management

Technology which serves as the foundation for establishing an environment where automated supply chain decisions, such as logistics and inventory management, can be optimized within the network using decentralized autonomous manufacturing technology

↘ Order-based Joint Technology

Collaborative platform-based technology that offers integrated design, manufacturing, and servitization capabilities to meet on-demand production requirements

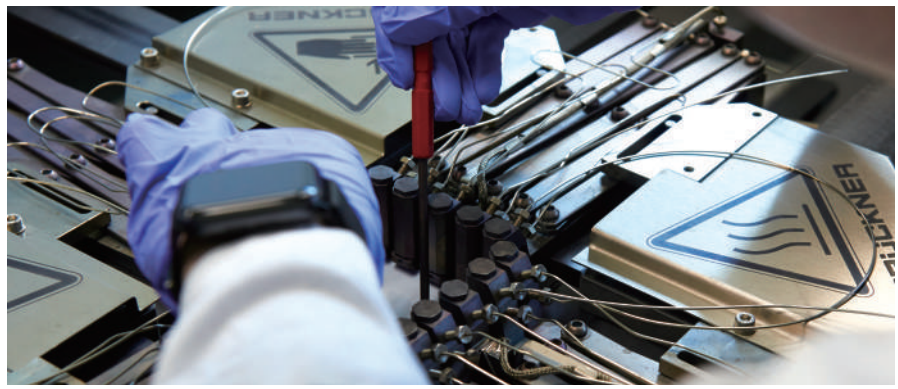
Technology that lays the groundwork for future production systems by establishing a collaborative value creation network encompassing design, material sourcing, and manufacturing, capable of meeting a wide range of product demands

HUMAN-CENTRIC MANUFACTURING TECHNOLOGY

Throughout the manufacturing, product design, and development phases,

KITECH adopts manufacturing technology that prioritizes human needs, preferences, and the enhancement of quality of life.

KEY AREAS



Human-Friendly Manufacturing

Robotic, digital, and process technologies that serve as the foundation for manufacturing processes tailored to human needs and comfort

↘ Human-Centric Robot Technology

Human-robot interaction and collaborative technology

Platform model and verification technology for the application of human-centered robots in industrial settings(manufacturing and services)

↘ Autonomous Manufacturing Technology

Advanced manufacturing processes facilitated by digital transformation, automation, and human-centered work environment platforms

Innovative manufacturing processes and human-friendly technology for future digital components(hardware and software of intelligent semiconductors, displays, secondary batteries, fuel cells, sensors, etc.)

Customer-Oriented Manufacturing

Human-oriented products and services based on user safety and convenience values

↘ User Convenient Technology

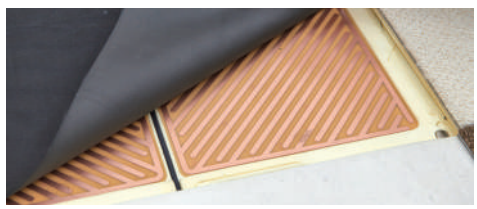
Materials, products, platforms, and service technologies that directly or indirectly enhance user convenience across various domains of application

Technology that offers user risk assessment platform services for materials and products

↘ Safety Convergence Technology

Convergence technologies encompassing user safety-related materials, products, and services

Convergence technologies addressing materials, products, and services designed to safeguard living, manufacturing, and work environments



SUSTAINABLE DEVELOPMENT TECHNOLOGY

KITECH implements digital production processes, embraces circular economy principles, and

deploys next-generation safety controls to harness sustainable energy and address climate change.

KEY AREAS

Zero Carbon Emission

Technology aiming for zero greenhouse gas emissions and minimizing environmentally harmful substances in energy production and utilization, among other areas

↘ Carbon Emission Control Technology

Technology for generating and utilizing carbon-free and low-carbon energy in the energy sector as a response to climate change

Technology aimed at reducing pollutants, including greenhouse gases, and monitoring emissions from power generation, industrial, and manufacturing processes

↘ Industry Environment Management Technology

Technology for actively managing energy and environmental aspects of industrial processes

Technology for monitoring industrial hazards, constructing databases, and implementing systematic management

Green Transformation

Technology encompassing the circulation of energy and environmental resources, as well as the development of alternative materials to manage environmentally hazardous substances. This is facilitated by employing chemical conversion technology on industrial wastes

↘ Eco-friendly Resource Circulation

Technology for transforming the finite structure of energy/resources into a circular one

Technology for converting industrial waste through chemical processes into raw materials and high value-added materials

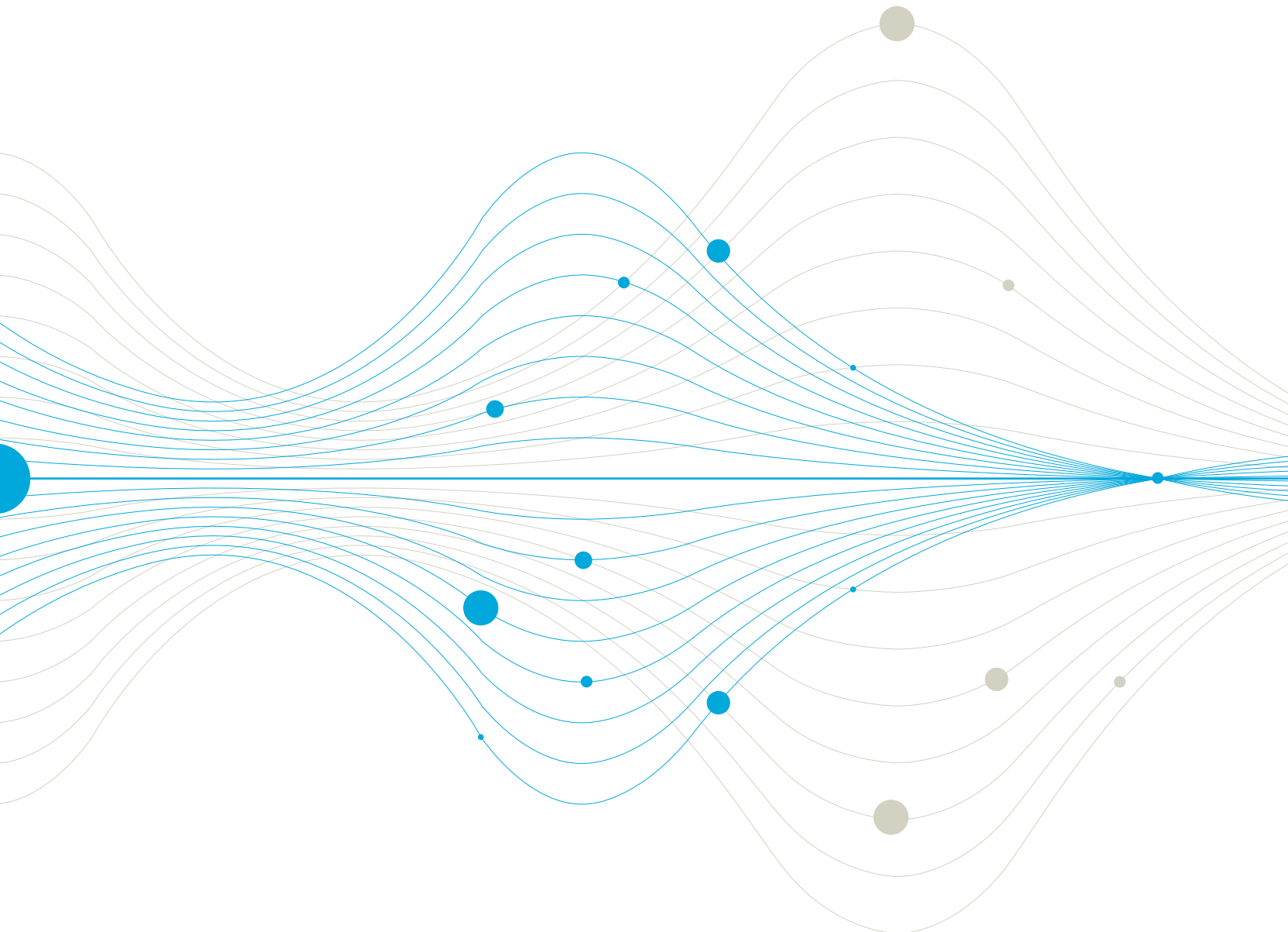
↘ Substitution of Harmful Factors

Technology capable of substituting environmentally harmful materials in established industries

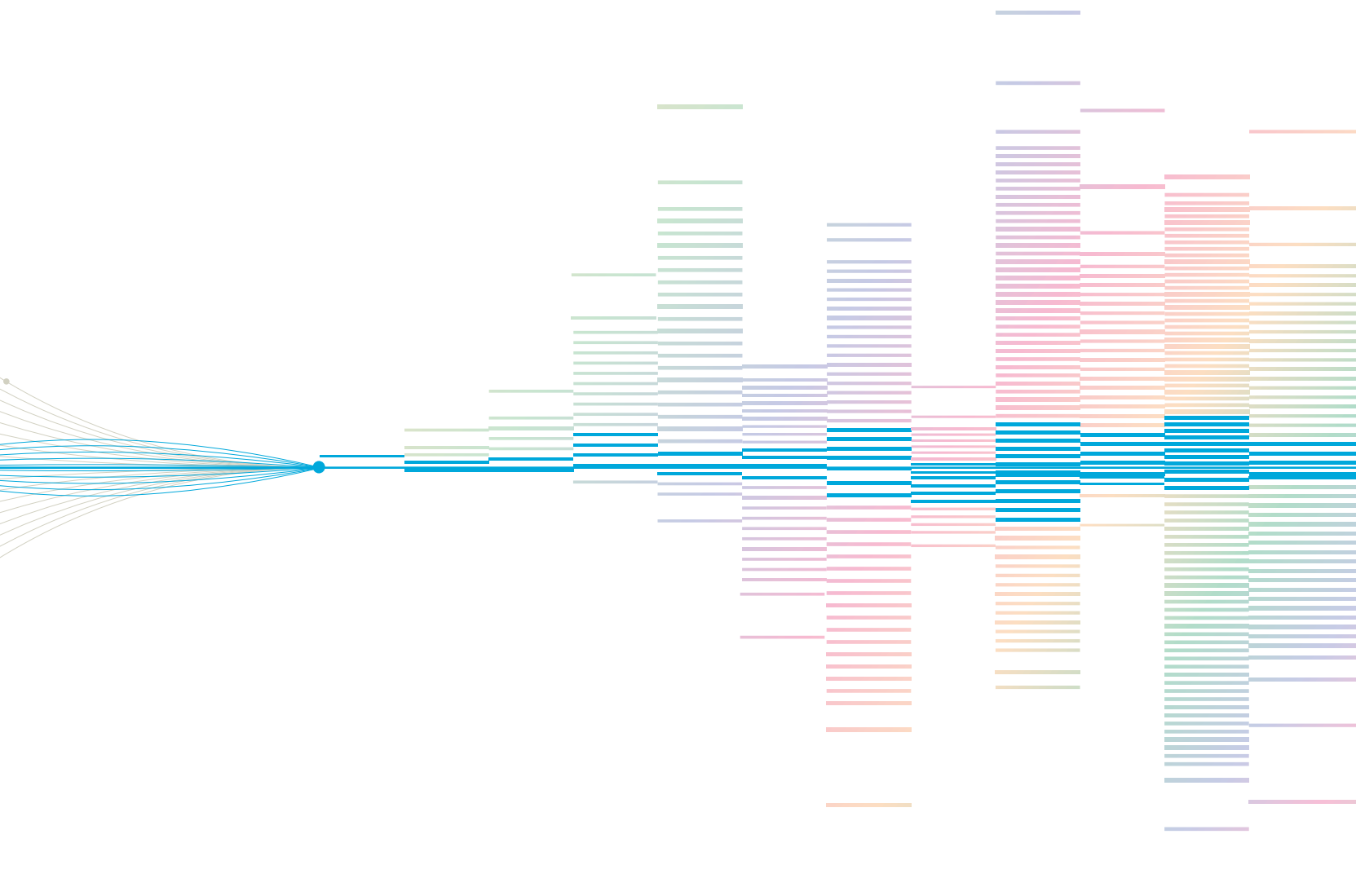
Eco-friendly alternative materials and process technologies designed to replace hazardous chemicals utilized in power generation, industry, and manufacturing processes

GROW TOGETHER

KITECH nurtures local industries and revitalizes the corporate innovation ecosystem through a network promoting shared growth. Moreover, it fosters international joint research through strategic international cooperation and supports small and medium-sized manufacturers in entering the global market.



Part 2

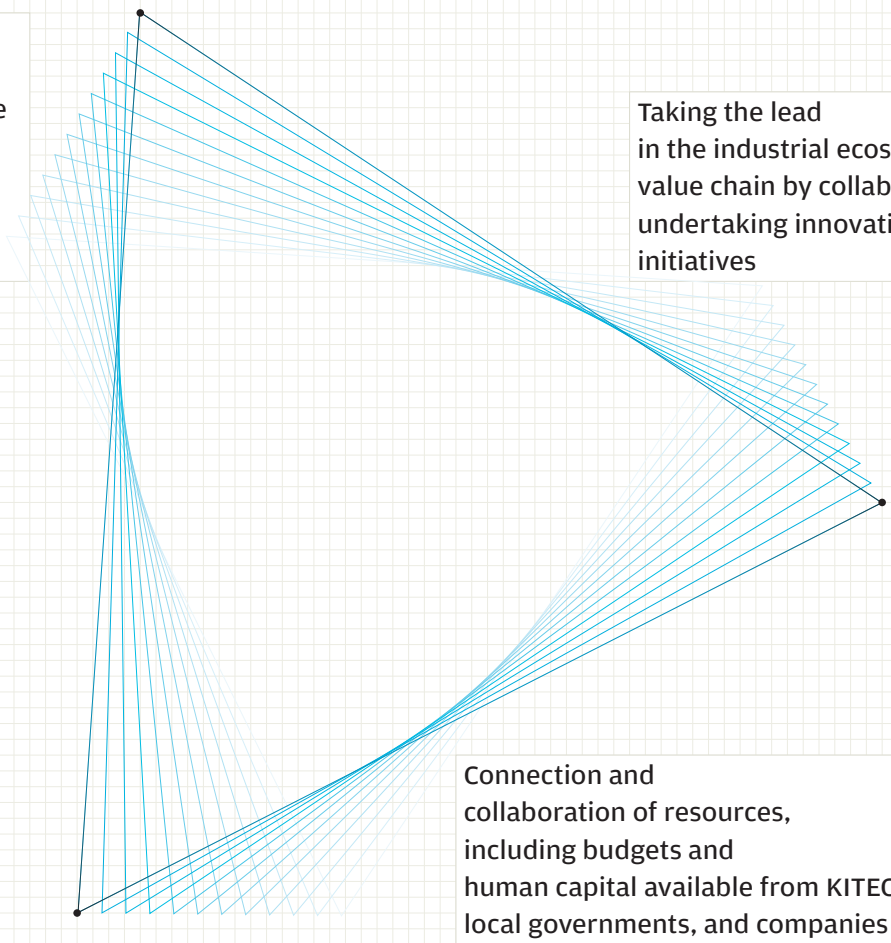


MEGA PROGRAM

REALIZATION OF REGIONALLY CUSTOMIZED INDUSTRIAL INNOVATION THROUGH COLLABORATION AMONG KITECH, LOCAL GOVERNMENTS, AND ENTERPRISES

To combat the escalating decline of local areas, resulting from demographic cliff and regional disparities, focal points are researched for each region, along with headquarters, local governments, and companies, for collaboration to foster specialized industries within these respective regions.

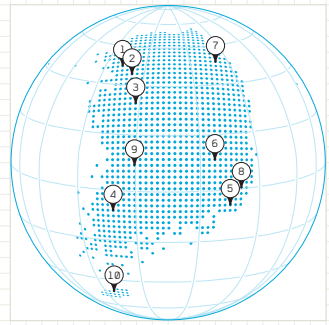
Long-term and intensive nurturing of core companies that drive innovation within the major value chains of regionally specialized industries



Taking the lead in the industrial ecosystem's value chain by collaboratively undertaking innovation initiatives

Connection and collaboration of resources, including budgets and human capital available from KITECH, local governments, and companies

MEGA PROGRAM



	MEGA PROGRAM		
1	**Research Institute of Intelligent Manufacturing & Materials Technology** Incheon	**Bio· Semiconductors**	• Technology for semiconductor materials, equipment components, and raw materials • Advancement in automation processes for synthetic biology • Technology for the production process and commercialization of bio-devices
2	**Research Institute of Human-Centric Manufacturing Technology** Ansan	**Manufacturing Robots**	• Development and validation of an empirical model leveraging advanced robots (comprising multiple complex cells)
3	**Research Institute of Sustainable Development Technology** Cheonan	**Emission Reduction System**	• Development of technology aimed at reducing carbon emissions and harmful gases in semiconductor and display manufacturing processes
4	**Seonam Technology Application Division** Gwangju	**Purpose-Based Mobility**	• Development of essential technologies for implementing PBV(Purpose-based vehicles) in logistics • Advancement in AI vision technology tailored for PBV customization
5	**Dongnam Technology Application Division** Busan	**Extreme Energy Infrastructure**	• Development of fundamental equipment and verification technologies for energy storage and supply under extreme environmental conditions, including extremely low temperatures, ultra-high pressures, oxidation corrosion, and high radiation
6	**Daegyeong Technology Application Division** Daegu	**Mobility Components**	• Development of advanced technology for designing and manufacturing high-performance motors and components for mobility applications
7	**Gangwon Technology Application Division** Gangneung	**Metaceramic Materials/Parts**	• Development of manufacturing technology for semiconductor and meta-ceramic composite materials and parts intended for future mobility applications
8	**Ulsan Technology Application Division** Ulsan	**Low Carbon/ Hydrogen-Integrated System**	• Water electrolysis technology for producing green hydrogen • Technology for CO_2-free ammonia decomposition and clean hydrogen production systems
9	**Jeonbuk Technology Application Division** Jeonju	**Purpose-Built Mobility**	• Development of a spacious premium tractor cabin and load-sensitive transmission system • Development of an eco-friendly small electric tractor
10	**Jeju Technology Application Division** Jeju	**Clean Energy Recycling System**	• Technology for resource recycling, distributed energy, and clean energy utilization

CORPORATE COOPERATION PROGRAM

DIGITAL PLATFORM FOR CUSTOMIZED SHORT-DELIVERY PRODUCTION

Facilitating the Discovery of Outstanding Technologies and Linking Them with Purchasing Companies to Enhance Profits for Small and Medium-sized Enterprises

Fostering connections between domestic and international purchasing entities(buyers) and promoting technical collaboration, KITECH bolsters corporate sales growth with short-term, customized delivery solutions.

Video Promotion of Manufacturing Technology

Promotion of manufacturing technology videos through omni channels, including customized digital platforms with fast delivery, institutional promotional channels (YouTube, Instagram, Facebook, etc.), and dedicated corporate YouTube channels

Technical Collaboration for Resolving Redundant Production Challenges

Technical assistance in manufacturing products as per the demands of purchasing companies(buyers), ensuring required performance, short-term R&D, facilitating connections between manufacturing companies and leading technologies of **prominent companies***, and supporting the alignment of features and certifications

* **Prominent company** : A company that supports design and technology required by manufacturing companies to meet the product performance requirements of purchasing companies

The Process of a Customized Digital Platform with Rapid Delivery

Process

Step 1 /4	Step 2 /4	Step 3 /4	Step 4 /4
Search for Excellent Manufacturing Technology	**Collaboration with Famous YouTubers**	**Technical Support**	**Order Success**
Discovery of hidden excellent technologies among domestic manufacturing companies	Videos filmed and edited by renowned YouTubers and promoted across multiple online platforms	KITECH collaboration to provide essential technical support for delivering products to purchasing companies	Profits generated through the rapid delivery of products desired by both domestic and foreign purchasing companies

CORPORATE COOPERATION PROGRAM

OPERATION OF PARTNER COMPANY FRAMEWORK

Providing Services Aimed at Corporate Profitability Based on K-PI (KITECH Partnership Index)

KITECH enhances its partnership framework with companies by offering tailored corporate collaboration digital platforms (for information, equipment, technology development, demonstration, commercialization, etc.) at each stage of growth. Additionally, KITECH furnishes R&D-based technological assistance to its partner companies, fosters technological innovation through its technical community, and offers on-site support. KITECH provides a range of benefits, including hands-on support through business trips.

Qualification of Partner Company

- A company that has effectively collaborated on research and development with KITECH
- A company that has received technical support from KITECH
- A company that has entered into a patent technology transfer agreement with KITECH
- A technology-intensive company exhibiting strong growth potential in the materials, components, and equipment sectors

Support to Partner Company

R&D-Based Technical Support	Research Equipment Support
- Assistance for short-term R&D projects to address technical challenges - Support for industry-research collaborative projects - Support for joint research facilitated by government-commissioned projects	- Access to research equipment via open laboratories and specialized facilities tailored to small and medium-sized enterprises
Dispatch of Proficient Research Personnel	**Demand-Driven On-Site Assistance**
- Deployment of skilled master's and doctoral graduates for extended periods(up to three years) as pivotal R&D staff	- Technical consultancy provided through on-site visits and personnel deployment to companies grappling with technical issues - One-on-one mentorship for technical support
Technical Information Provision	**Technological Innovation Exchanges through Technology Communities**
- Regular dissemination of technical updates covering national R&D initiatives, government policies, educational resources, seminars, patent technology transfers, technological trends, and forums	- Facilitation of technological exchanges among companies, including new market exploration and dissemination of R&D outcomes, facilitated through 32 technology communities (454 companies)

CORPORATE COOPERATION PROGRAM

TECHNOLOGY TRANSFER SUPPORT

Establishment of KITECH's Proprietary R&BD Process to Catalyze Technology Transfers

KITECH discovers and nurtures consumer-centric technologies from the outset of R&D planning to patent application, also providing IP management support services across the entire lifecycle, spanning technology transfer, commercialization, and post-management.

Meaning and Purpose of Technology Transfers

Enhancing the success rate of technology commercialization by sharing KITECH's R&D outcomes—encompassing technology, knowledge, and information—with companies and industries at large

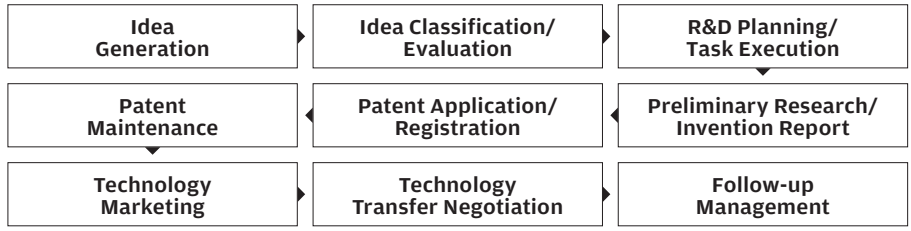
Technology Transfer Types and Methods

Technology Type	Technology Transfer Methods	Fee Payment Types
Intellectual property rights and know-how technology	Licensing (exclusive, non-exclusive, sole), transfer, etc.	Fixed payment, running royalty, etc.

Operation of Technology Commercialization Strategy Program

Operation of on-demand corporate services, projects aimed at bolstering technology transfer activation, etc.

R&BD Process for Technology Transfer and Commercialization



CORPORATE COOPERATION PROGRAM

OPERATION OF RENTAL LABS : A RESEARCH FACILITY EXCLUSIVELY FOR SMES AND MMES

Strengthening the Research Capabilities of SMEs and MMEs by Operating Rental Labs

KITECH offers research facilities to SMEs and MMEs seeking collaborative research with KITECH or efficient equipment utilization. Through close support utilizing its infrastructure, including labor and equipment, KITECH aids in enhancing productivity and technological competitiveness.

Support

Facility Support	Equipment Support	Support for Technology and Joint Research
- Occupancy space and mechanical facilities - Conference room, shared workspace, etc. - Basic utilities (electricity, water, etc.)	- Test analysis and measurement equipment, prototype production equipment, etc.	- Joint research for technology development - Technical guidance and advice - Technology exchange

OPERATION OF OPEN LABS

Open to SMEs and MMEs in Need of Cutting-edge, Expensive Equipment

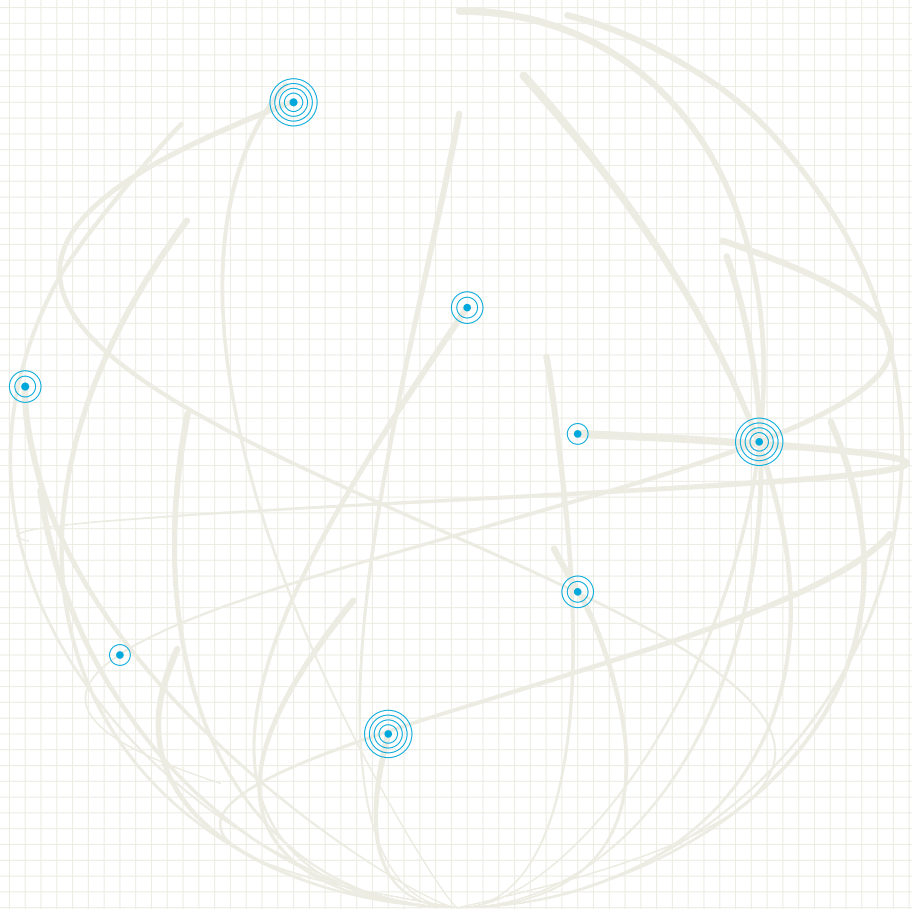
KITECH supports SMEs and MMEs by opening approximately 44 laboratories nationwide, facilitating their convenient access to cutting-edge and expensive equipment. Additionally, KITECH offers services like testing, inspection, and prototype production.

Operation Status of Open Labs by Region

Research Institute of Intelligent Manufacturing & Materials Technology 12 Labs	Research Institute of Human-Centric Manufacturing Technology 6 Labs	Research Institute of Sustainable Development Technology 4 Labs
Seonam Technology Application Division 5 Labs	Dongnam Technology Application Division 5 Labs	Daegyeong Technology Application Division 7 Labs
Gangwon Technology Application Division 1 Lab	Ulsan Technology Application Division 2 Labs	Jeonbuk Technology Application Division 2 Labs

GLOBAL COOPERATION PROGRAM

ENHANCING GLOBAL R&D COMPETITIVENESS AND BROADENING THE GLOBAL MARKET FOR INDUSTRIAL TECHNOLOGY



To address global challenges and secure future industrial technology, KITECH supports Korean companies trying to make inroads into international markets. This is achieved through strengthening strategic international joint research, fostering researcher exchanges, and establishing an open international cooperation platform. This platform facilitates collaborations among industry, academia, and research institutes by jointly utilizing overseas offices.

GLOBAL COOPERATION PROGRAM

International Cooperation Project

Domestic

Cooperation Project at Overseas Base

Establishing a foundation for sustainable research cooperation by backing initial joint research in identified areas of cooperation through strategic international collaborations at the institutional level

International Joint Research Project on Manufacturing Technology

Attaining world-class cutting-edge technology by facilitating international joint research and development in collaboration with esteemed overseas institutions

Development Project for Commercialization of Asian Local Technology

Assisting domestic SMEs and Middle-Market Enterprises in addressing technical challenges and bolstering global competitiveness as they venture into the Asian market

Overseas

Global Convergence Research Cooperation Support Center(Ministry of Science and ICT)

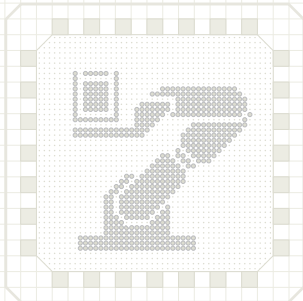
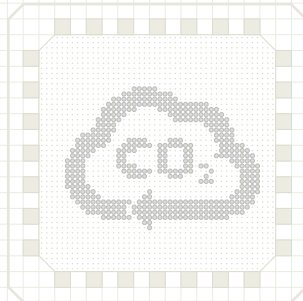
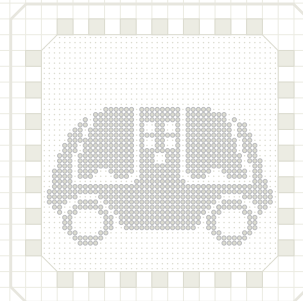
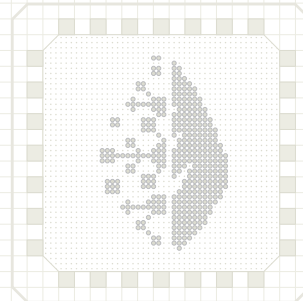
Facilitating the acquisition of future pioneering technologies through the design and advancement of convergence research with leading global research institutes, aimed at addressing forthcoming societal challenges

Industrial Technology International Cooperation Support Group (Ministry of Trade, Industry, and Energy)

Fostering the dynamism of global joint research within industry sectors, connecting domestic and foreign industry, academia, and research institutes, while providing systematic support for open technological innovation

* KITECH aims to conduct global R&D initiatives through strategic collaboration, identifying partners and securing support from government ministries for the establishment of a global R&D strategic base center

Key Areas of Cooperation

North America/Europe	China	Vietnam	Indonesia
			
Manufacturing AI	Carbon Neutrality	E-mobility	Resource Energy
Robots	Manufacturing Innovation	Fibers	E-mobility
Future Mobility	Digital Transformation	Renewable Energy	
Sustainability			

FROM MANUFACTURING TO VALUFACTURING

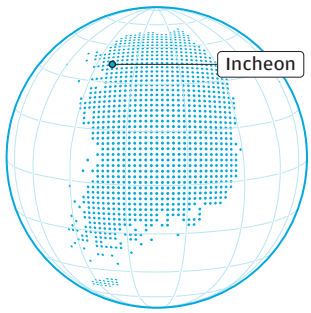
REALIZE IDEAS

To realize the vision of
the great transformation in the manufacturing technology,
KITECH will redefine the roles and functions of research institutes in
key research fields and regional commercialization headquarters.
KITECH aims to realize “ideas into technology” and “technology into reality,”
thereby advancing the value of the manufacturing industry.

Part 3

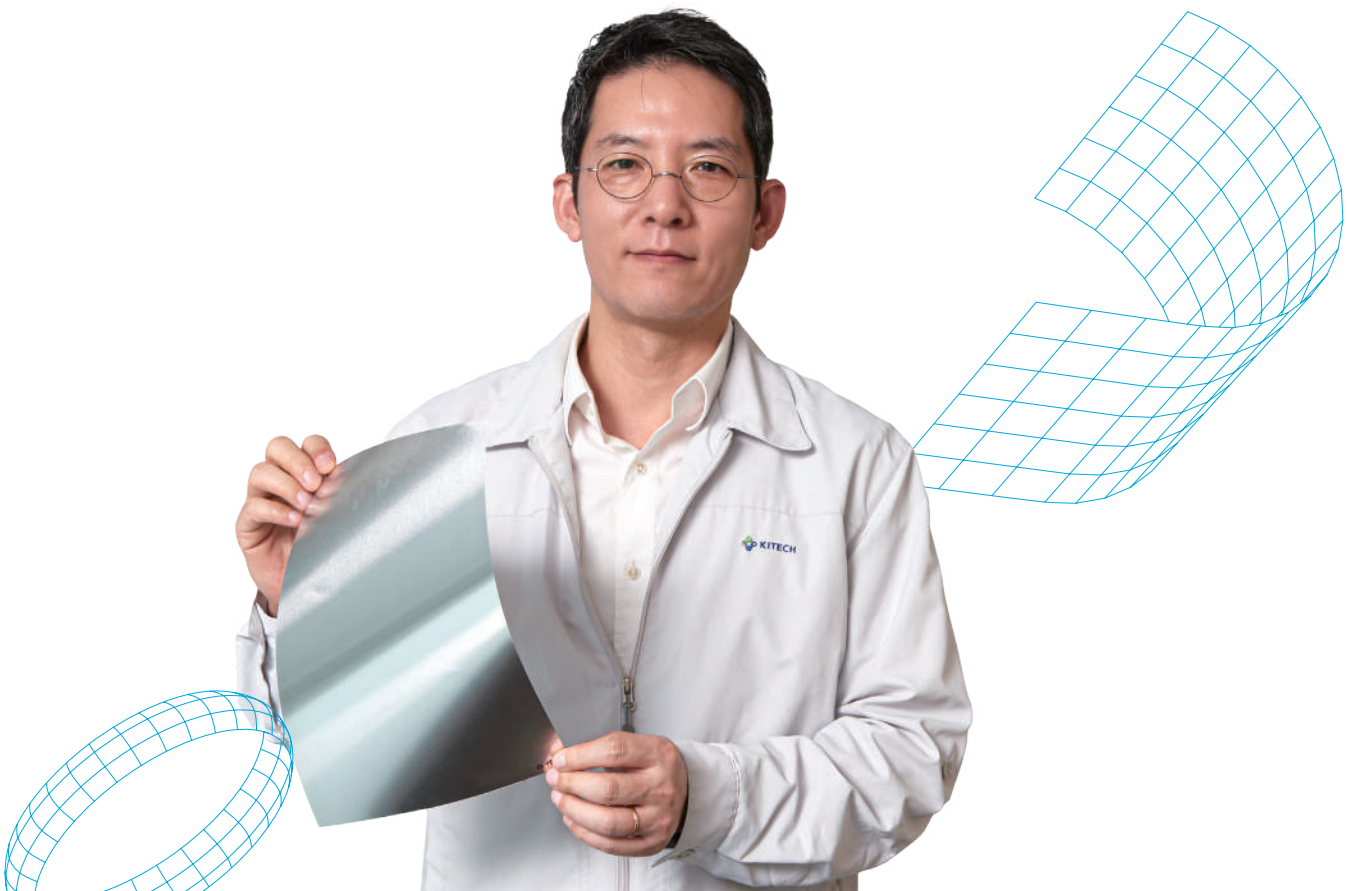
TECHNOLOGY APPLICATION
DIVISION

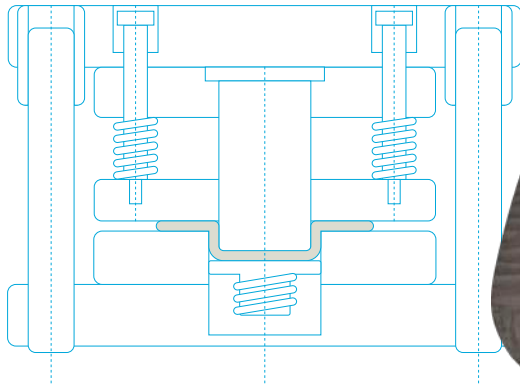
RESEARCH INSTITUTE OF INTELLIGENT MANUFACTURING & MATERIALS TECHNOLOGY



The Hub of Manufacturing Innovation, Driven by Advancements in Material Technology and Intelligent Manufacturing

The Research Institute of Intelligent Manufacturing & Materials Technology solidifies the foundational industry, transitioning from material production to part manufacturing and final product assembly through six existing material technologies.
Furthermore, it extends its efforts towards the development of essential next-generation process technologies for future growth, such as robotics, industrial intelligent software, sensors, and engineering design, injection presses, industrial films, precision processing, and 3D printing, providing technical support and disseminating the performance of SMEs and MMEs to contribute to the advancement of national industries.





R&D Sector

Materials and Supply Chain Research

Optimization of the core process technology within the existing supply chain through the intelligent integration of material process technology and material development

New Industrial Components Research

Development of new agile technologies for new parts expected to be in demand in key industries, such as advanced mobility

Flexible Manufacturing Research

Development of unit production processes, production modules, and equipment that can preemptively respond to future demands for small-scale production of multiple products

Customized Manufacturing Research

Development of short-delivery, one-demand 1 lot hybrid production process technology based on 3D printing, post-processing, and product design

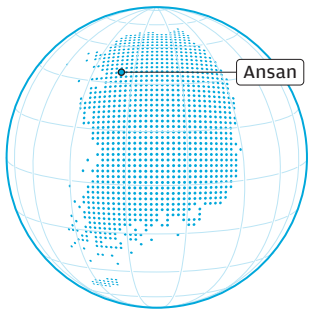
Digital Manufacturing

Research on digital, automated, and autonomous production and manufacturing that can adapt to the future production system and foster the molding industry in Bucheon City

Regional Industry Innovation(Growth Engine)

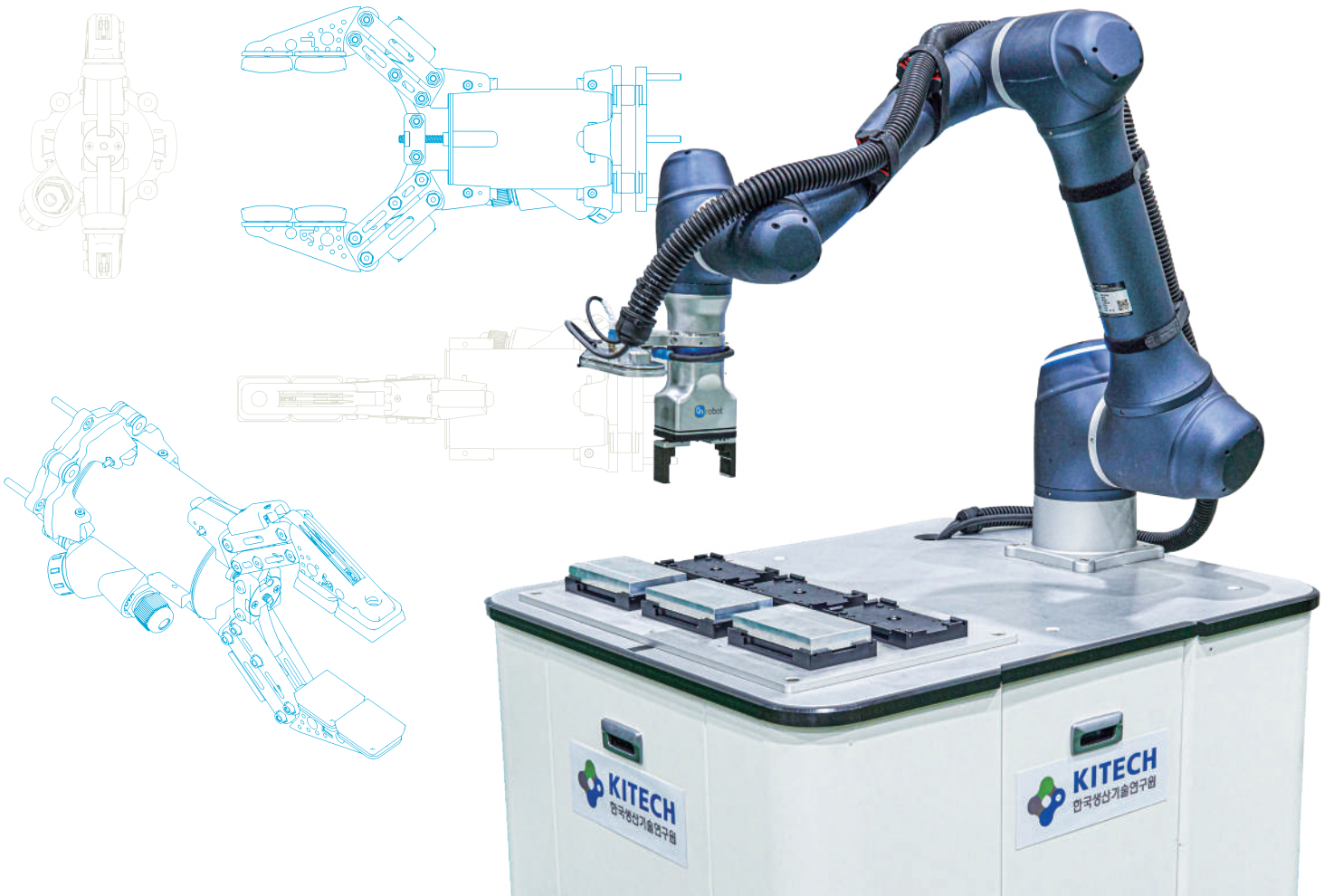
Development of core technologies to advance the local value chain, including semiconductor and bio industries,
which are key strategic industries in Incheon Metropolitan City

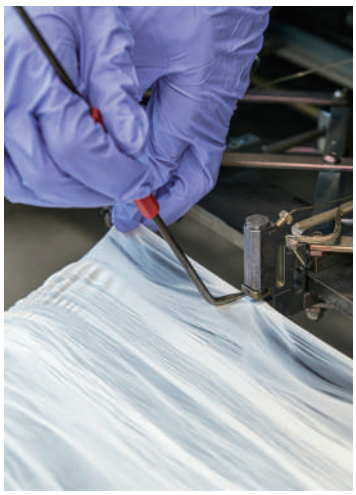
RESEARCH INSTITUTE OF HUMAN-CENTRIC MANUFACTURING TECHNOLOGY

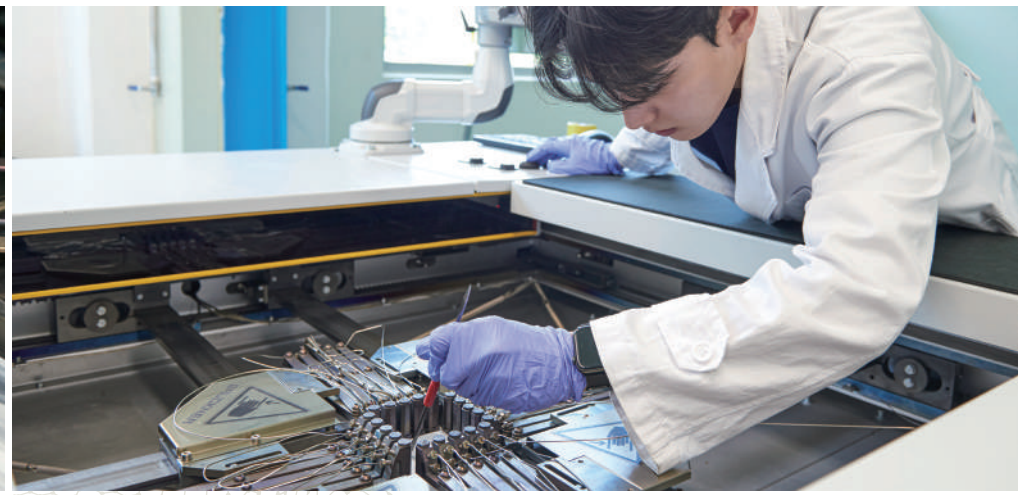


A Leading Group that Realizes a Human-centered Future Manufacturing Industry

The Research Institute of Human-Centric Manufacturing Technology is at the forefront of transforming the traditional manufacturing industry into a future-oriented one.
This transformation is driven by research focused on worker-friendly manufacturing, enhancing collaboration between workers and technologies like robots, as well as the user-centered design and development of products, services, and production systems.







R&D Sector

Human-Centric Robotics Research

Source technology for world-class manufacturing and service robots (cognitive control, vision robot intelligence, HRI, autonomous mobility, medical and rehabilitation robots, defense robots, space robots, etc.)

Robot platform H/W and S/W technology and commercialization technology applicable to manufacturing and service industries

Autonomous Manufacturing & Process Research

Research on manufacturing process intelligence/automation and a worker-friendly manufacturing environment platform through digital transformation

Research on innovative processes and human-friendly manufacturing processes for future digital components(H/W and S/W for intelligent semiconductors, displays, secondary batteries, fuel cells, sensors, etc.)

User Convenience Technology Research

Research on materials, parts, products, platforms, and service technologies that directly or indirectly provide convenience in users' lives

Research on digital culture, digital sensibility, and a healthcare platform to provide customized convenience and services

Research on user risk assessment platform services for materials and products

Safety Convergence Technology Research

Convergence research on user safety-related materials, products, and services

Convergence research on materials, products, and services for living, manufacturing, and work environment protection

Textile Innovation

Fiber-based advanced material manufacturing and processing technology to discover future mega program

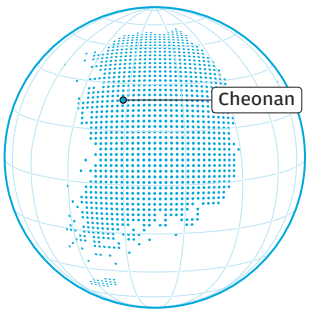
Human-friendly manufacturing conversion technology and high value-added textile material application technology

Regional Industrial Innovation(Manufacturing Robot)

Implementation of mega program, such as development and verification of process models using advanced manufacturing robots for local industrial innovation

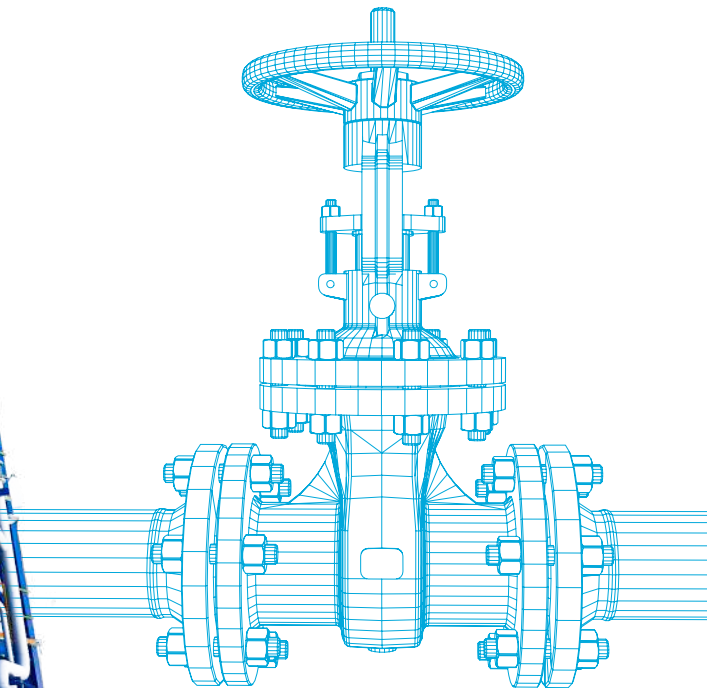
Process automation of local industry-linked packaging manufacturing and technology on eco-friendly functional packaging materials

RESEARCH INSTITUTE OF SUSTAINABLE DEVELOPMENT TECHNOLOGY



A Technological Hub for Transformation to Sustainable Future Industries

The Research Institute of Sustainable Development Technology supports the advancement of manufacturing site production systems, promoting a sustainable transformation of domestic industries. This is achieved through the development of zero-emission and green transition technologies, including the production and use of low-carbon energy and eco-friendly resource circulation.



R&D Sector

Low-Carbon Emission Control Research

Production and utilization of carbon-free fuel, measurement and emission control of air pollutant and greenhouse gas, thermochemical conversion of waste resource circulation, and process energy-environment digital conversion

Industrial Energy Research

High efficiency of industrial energy (fluid, heat, etc.) equipment, waste heat utilization and energy storage, heat pump and cooling systems, and eco-friendly refrigerant application technology

Green Circulation Research

Chemical upcycling materials and processes, research on substitution, utilization, and removal of environmentally hazardous substances, highly efficient and highly functional eco-friendly materials

Low-Carbon Transition Research

Research on low-carbon emission chemical materials and processes, materials utilizing carbon dioxide, and research on human-and environment-friendly material production processes

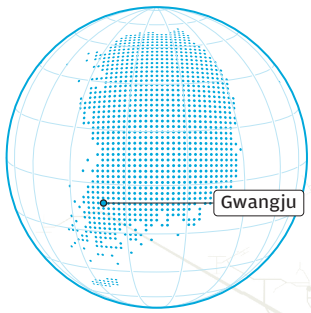
Industrial Transformation Technology

Manufacturing system efficiency, energy reduction, eco-friendly manufacturing technology, and smart sensor-based industrial safety servitization technology

Regional Industrial Innovation(ESH)

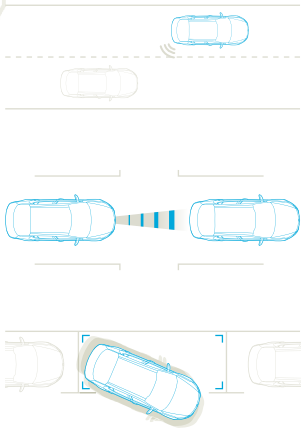
Planning and implementation of KITECH mega program, development of corporate ESH contribution technologies, implementation of regional specialized projects for metropolitan and basic local governments and establishment of regional win-win cooperation strategies, and planning of mid-to large-scale R&D for local governments

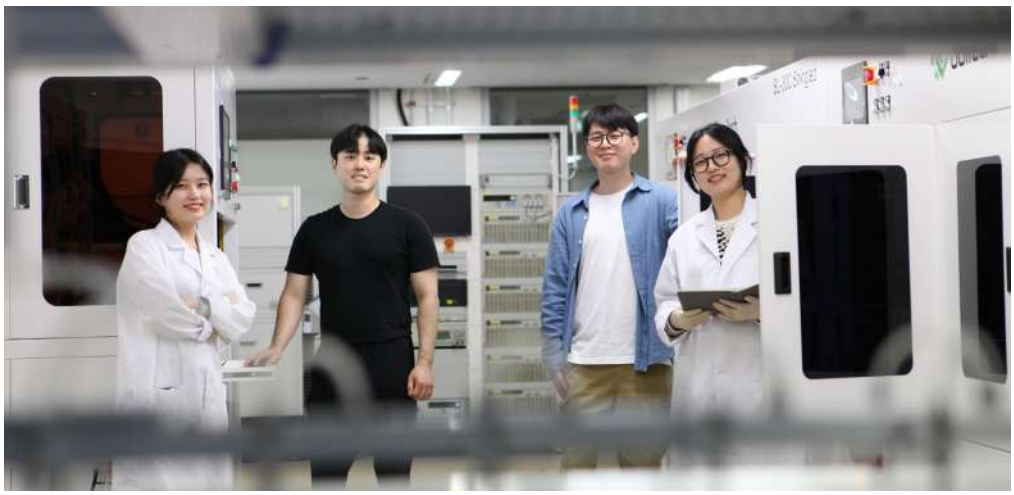
SEONAM TECHNOLOGY APPLICATION DIVISION



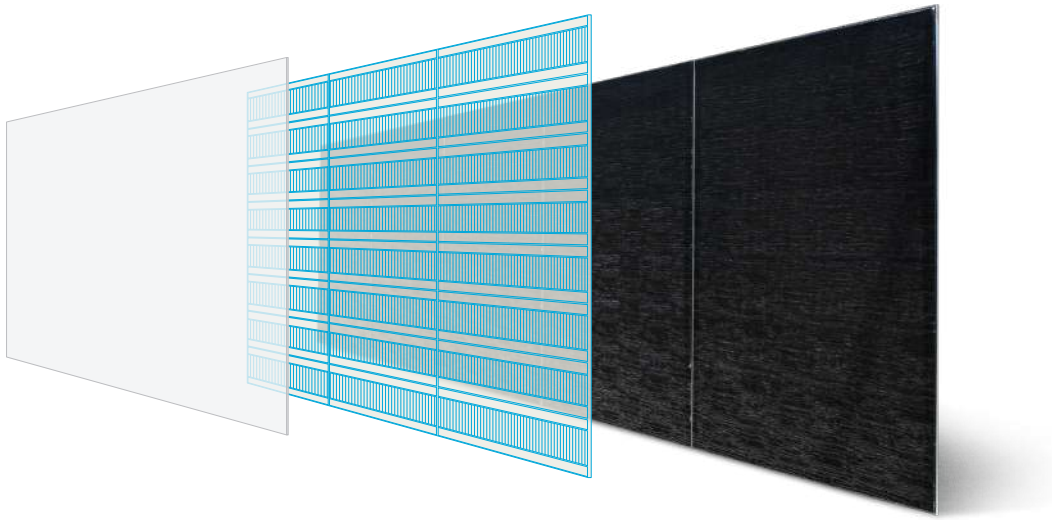
Stronghold of Core Technologies for Future Mobility

The Seonam Technology Application Division develops and commercializes technologies in autonomous driving, materials for parts, eco-friendly energy, and nanotechnology-based sensors for purpose-based vehicles(PBV), with a view to transforming the industrial structure of the Southwest region into a high value-added type.
It is leading the research on future mobility and the development of specialized industries.





Shinlged BIPV module



R&D Sector

Purpose Built Mobility Group

Application of PBV manufacturing technology

Purpose-based vehicle control and autonomous driving platform technology

High-efficiency electric power component design·application technology

Multi-functional lightweight materials and componentization technology for lightening car bodies

High-strength, lightweight material molding·processing and welding·joining technology

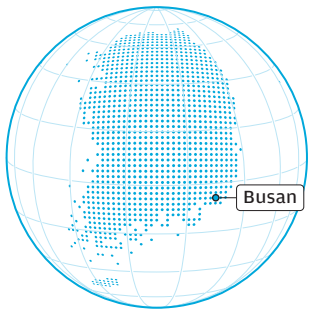
Energy & Nano Technology Group

Manufacturing technology for next-generation energy storage materials, components, and systems:
All-solid-state secondary batteries, P2G(hydrogen production) technology

Optical semiconductor device, module, and component manufacturing technology:
Optical communication, automotive semiconductor, convergence sensor unit, and batch processing technology

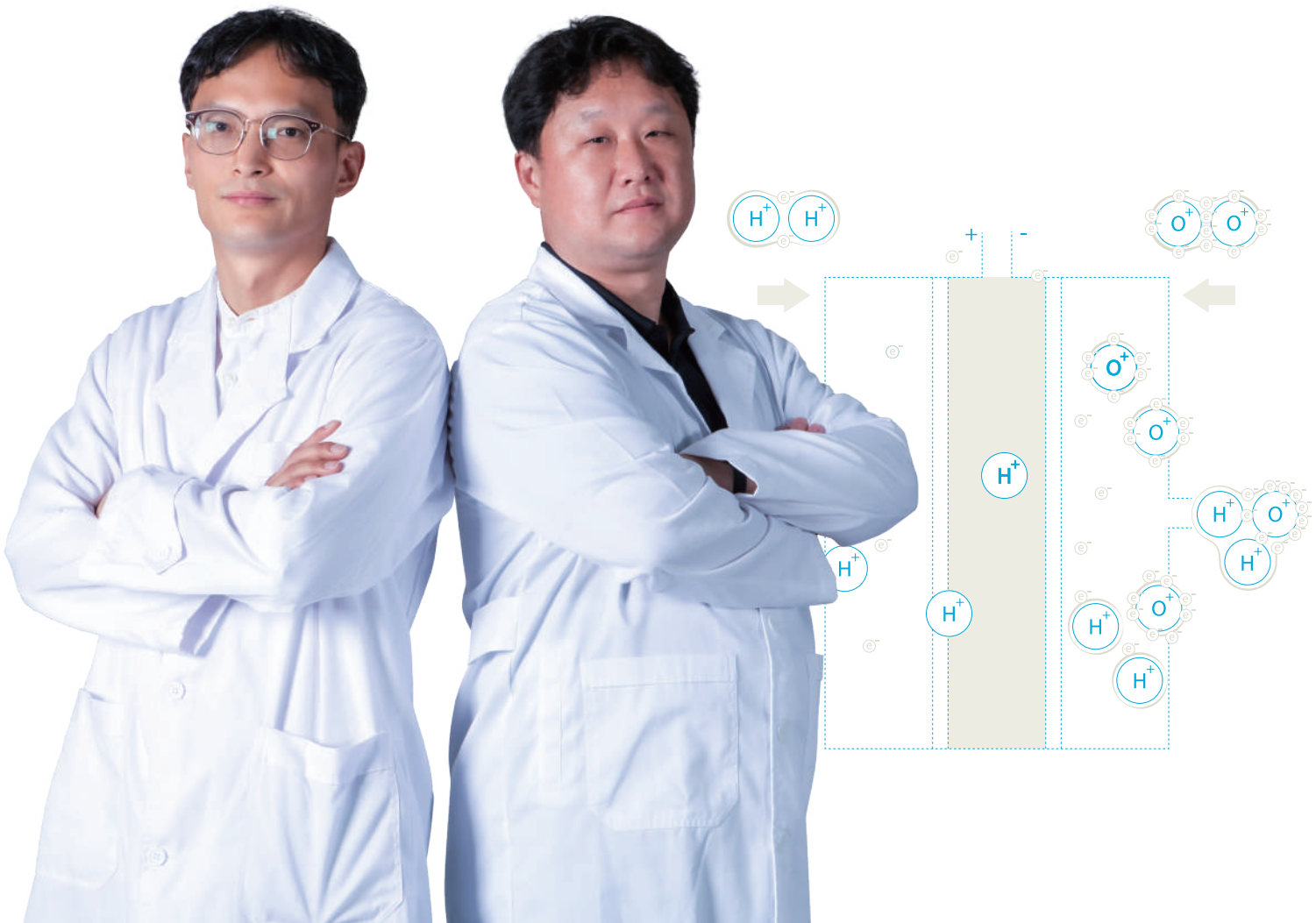
Material and component technology for energy production systems:
Solar energy, fuel cells, water electrolysis, waste heat-related core materials and production base technology

DONGNAM TECHNOLOGY APPLICATION DIVISION



A Leader in Korea's Basic Industries and Energy Industries

The Dongnam Technology Application Division discovers new growth engines in future energy fields, including cryogenic ultra-high-pressure energy, marine, nuclear power, and industry-related systems and equipment, also fostering regional specialized industries like high-tech mobility and precision machinery in the future semiconductor field.
By commercializing key industries, it supports local industrial development.



R&D Sector

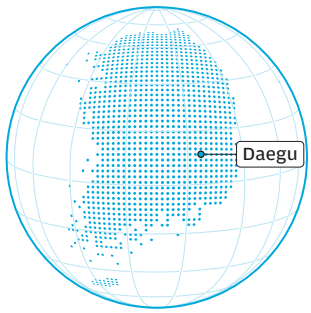
Energy System Group

Component materials and mechanical systems for extreme energy environments, such as ultra-low temperature, ultra-high pressure, high vacuum, nuclear power, and marine environments

Extreme Process Control Group

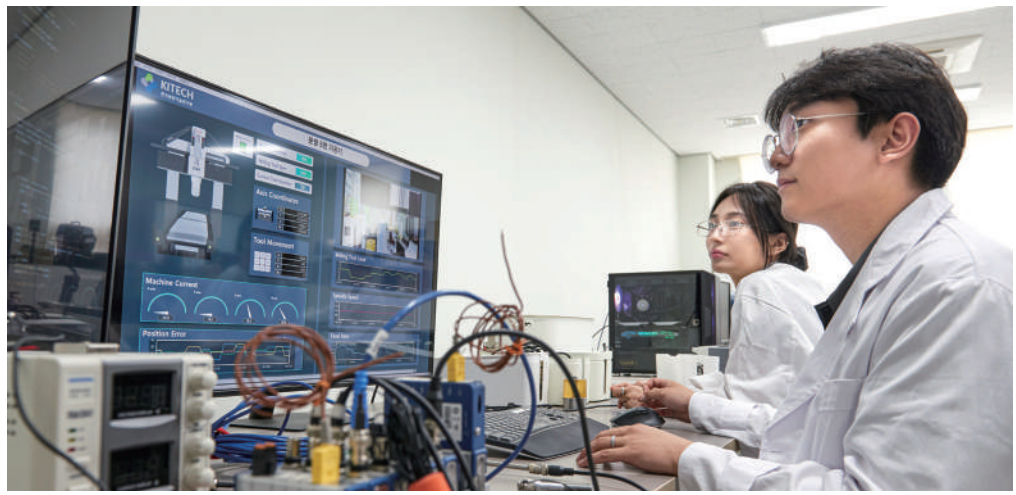
Advancement of element technologies linked to extreme systems, such as semiconductors, marine robots, and wet surface treatment

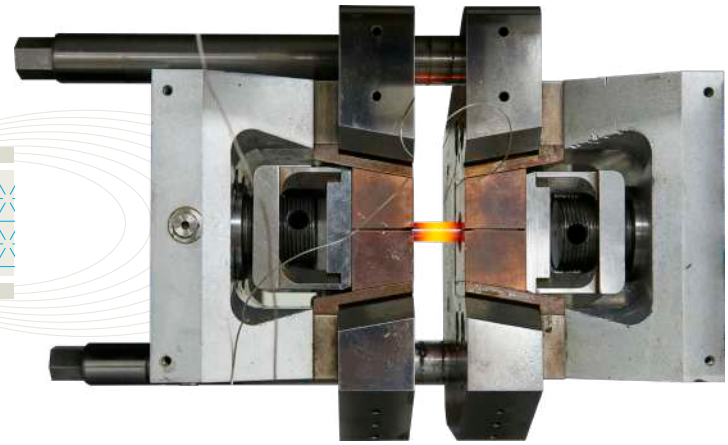
DAEGYEONG TECHNOLOGY APPLICATION DIVISION



Strategic and Specialized Industrial Hub for the Daegu-Gyeongbuk Region

The Daegyeong Technology Application Division supports innovation in both downstream and upstream demand industries by establishing smart and intelligent systems for AI-based production processes, fostering future strategic industries in the Daegu and Gyeongbuk regions. It also provides on-site technical support, contributing to industrial development in these areas.





R&D Sector

Advanced Mobility Components Group

Development of advanced parts and material molding technology for future mobility based on digital transformation, twin, and artificial intelligence

Comprehensive technical support for international standards for high-tech bearings and fostering global bearing companies

Development of digital manufacturing technology for future mobility core components using the technology of additive manufacturing processes and DfAM(Design for additive manufacturing) technology

Establishment of a corporate cooperation system to establish high-profit SMILE manufacturing technology for flagship and strategic industries and manufacturing companies in the Daegu and Gyeongbuk areas

Advanced Mobility System Group

Human-friendly system, mobility intelligent platform technology

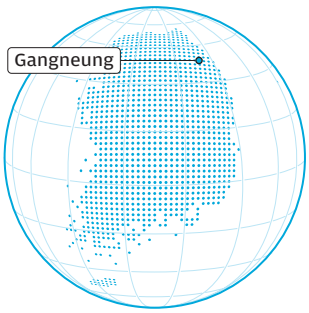
Development of advanced smart sensor-based future mobility components and systems

Development of core technology for ultra-high efficiency motors for advanced mobility

Development of smart eco-friendly construction machinery technology

Development of intelligent technology for manufacturing advanced convergence medical devices based on bio-mobility

GANGWON TECHNOLOGY APPLICATION DIVISION



The Backbone of Gangwon Special Self-Governing Province's High-tech Industry Development

The Gangwon Technology Application Division has identified its key research areas: industrial demand for non-ferrous manufacturing technology, smart nano material technology, additive manufacturing-based parts, and product commercialization technologies.
Its efforts contribute to the advancement of high-tech industries, such as convergence new materials, digital healthcare, and e-mobility, which are being promoted by Gangwon Special Self-Governing Province.

R&D Sector

Functional Materials and Components Group

Development of source technology for manufacturing functional materials and parts

- Manufacturing of non-ferrous materials and parts for industrial demand (energy storage, resource circulation, etc.)
- Additive manufacturing process-based parts application technology (medical, aviation, etc.)
- Manufacturing of smart nano materials and parts (catalysts, sensor materials, etc.)
- Material technology-based materials and manufacturing

Development of application technology for regional flagship and specialized industries

- Advanced ceramic materials and components for extreme environments to respond to Gangwon's high-tech industries(semiconductors, e-mobility, etc.)
- Additive materials and processes for commercialization of medical devices and aviation parts
- Materials and components in the carbon-neutral resources and energy(hydrogen, storage, production, etc.) field

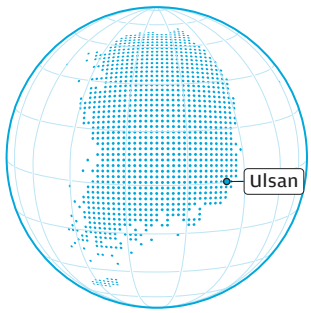
Establishment of a technical cooperation network for SMEs and MMEs in Gangwon-do

- Professional labor and infrastructure support for technical cooperation with small and medium-sized enterprises in Gangwon-do
- Total solution operation to support engineering companies, including materials, advanced manufacturing, and analysis and evaluation
- Packaged technology support linked to manufacturing technology, test analysis, and performance/reliability evaluation
- Dissemination of new growth industry information through technology seminars and corporate community operations

Establishment of regional strategies for upgrading and cutting-edge manufacturing industries

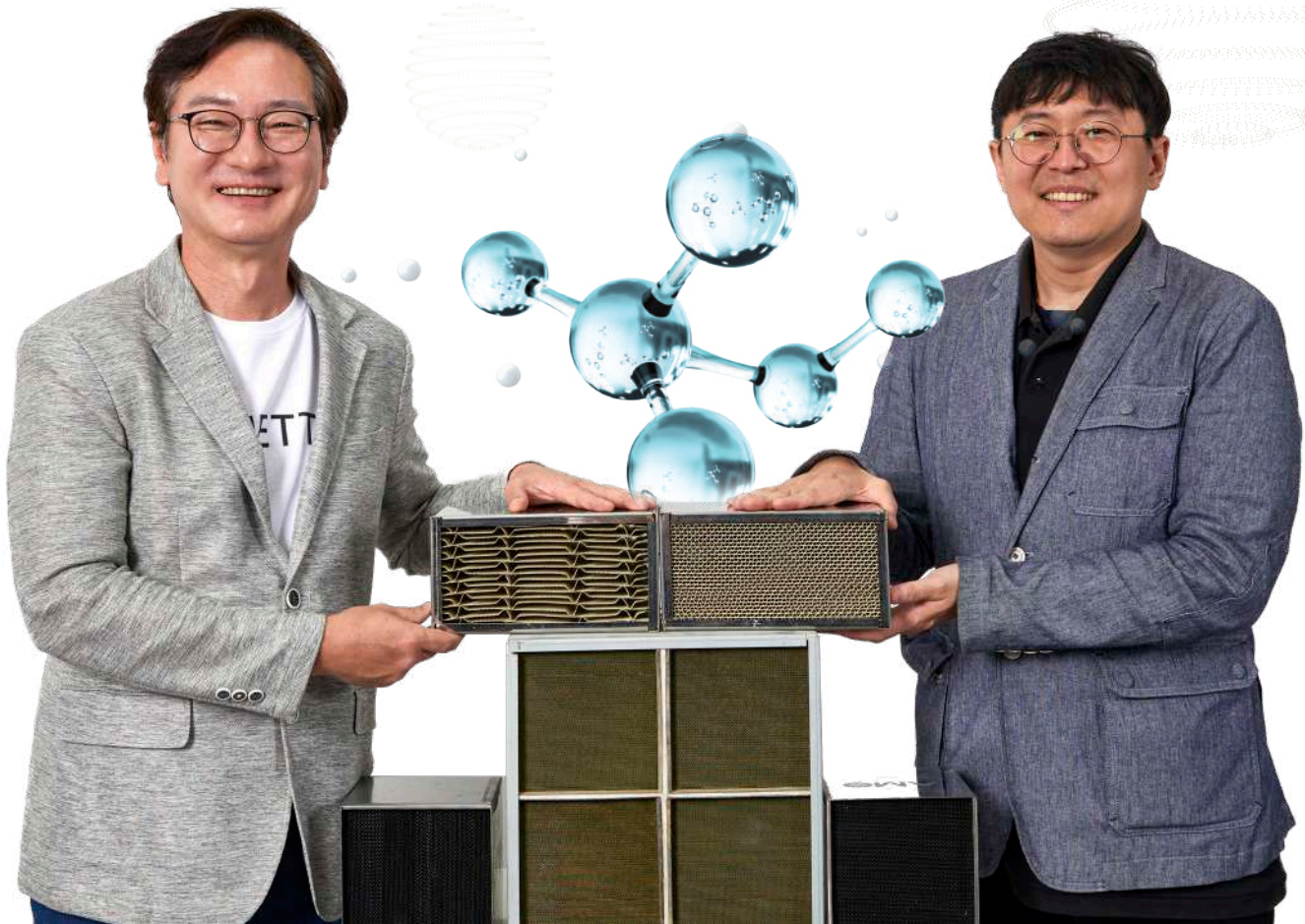
- Discovery of new regional growth industries and establishment of development strategies by fostering networks with local governments and regional innovation organizations
- Creating a foundation for industrial advancement by establishing industry, academia, research, and government technology and policy networks
- Presenting regional development strategies through establishing regional new growth industry strategies

ULSAN TECHNOLOGY APPLICATION DIVISION



The Hub of a Sustainable Low-carbon Hydrogen Industrial Ecosystem

The Ulsan Technology Application Division fosters the sustainable energy industry through full cycle verification of low-carbon hydrogen industries and integrated parts manufacturing.
It supports regional specialized industries by leading regional innovation and creating new growth engines through the transition to high-tech industries.



R&D Sector

Low Carbon Energy Group

Full-cycle technology of hydrogen industry and low-carbon energy technology

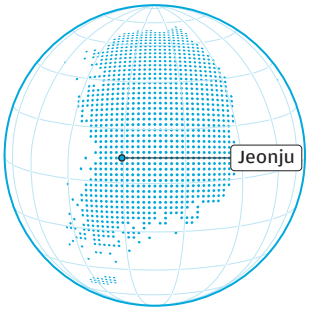
- Full-cycle verification technology of hydrogen industries
  - Development of an alkaline·PEM water electrolysis system
  - Development of hydrogen manufacturing technology based on waste resources
  - Development of Turquoise Hydrogen production catalyst and process technology
  - Development of electrode production and analysis technology for hydrogen fuel cells
  - Development of solid electrolyte and battery manufacturing technology for all-solid-state batteries
  - Development of ultra-precision processing technology for key hydrogen mobility components
- Low-carbon process technology
  - Development of greenhouse gas reduction and utilization process technology
  - Development of non-organic/organic carbonate manufacturing technology and useful resource recovery technology
  - Intelligence technology of production process utilizing AI and machine learning to reduce carbon emissions
  - Low-carbon energy generation technology to reduce carbon emissions
  - Development of low-carbon process and parts technology for next-generation mobility

Smart Forming Process Group

Material·part·process application technology linked to low-carbon hydrogen integrated system and utilization

- Application of smart processes for parts manufacturing linked to hydrogen integrated systems and utilization
- Discovery of innovative(partner) companies related to low-carbon/hydrogen integrated systems and technical support
- High-tech commercialization and corporate support to foster Ulsan's specialized industries and respond to regional extinction

JEONBUK TECHNOLOGY APPLICATION DIVISION



The Birthplace of Digitalization and Advancement in Special-purpose Machinery

The Jeonbuk Technology Application Division is driving the transformation of the industrial landscape in the Jeollabuk-do region, poised as the economic hub of the West Coast.
It nurtures key industries in Jeonbuk, particularly special-purpose machinery, by spearheading the development and support of digital convergence technology, thereby catalyzing the resurgence of local economies.

R&D Sector

Special Machinery and Robotics Group

Industrial transformation technology of digital special-purpose machinery

Industrial transformation technology of carbon-neutral special-purpose machinery

Special-purpose machine automation and advancement technology

Carbon & Light Materials Group

High-performance upcycling technology of resource circulation-based carbon nanocomposite

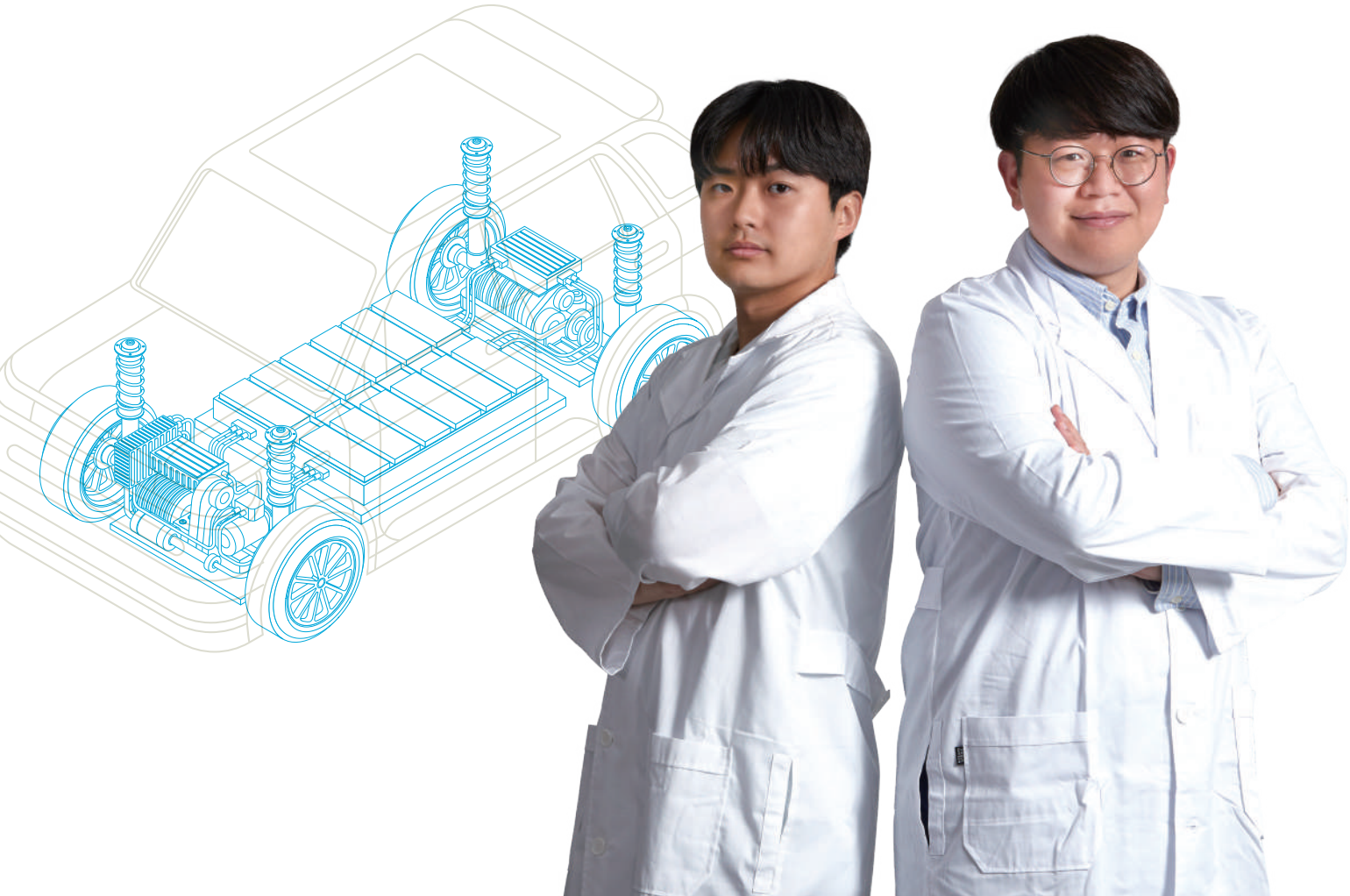
Technology for commercializing high-performance parts using carbon nanocomposites

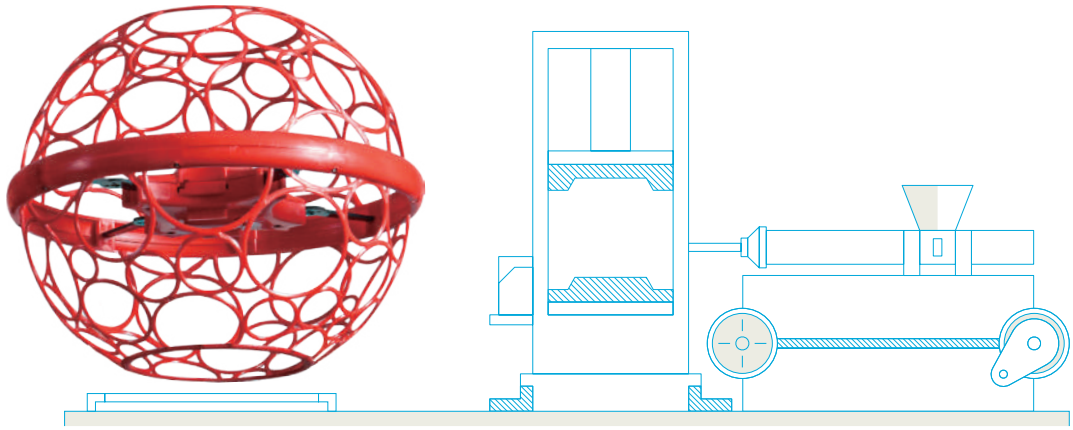
Advancement technology of material processing for manufacturing lightweight materials and parts

JEJU TECHNOLOGY APPLICATION DIVISION

Think Tank Ushering in a Clean Energy Transition

The Jeju Technology Application Division harnesses Jeju's plentiful clean resources, laying the groundwork for innovative convergence industries, facilitating a significant shift towards clean energy.
Its focus extends to developing technologies that will spawn new engines of future growth.
Through the establishment of a framework for commercializing locally-driven manufacturing technology, it actively enhances the technological prowess of small and medium-sized enterprises in Jeju, thus propelling forward the local industrial framework.





R&D Sector

Clean Energy Transition Group

Development of core technologies for clean energy conversion based on distributed energy

Development of AI-based future mobility condition diagnosis and predictive maintenance technology

Development of natural ecological resources, high value-added products, and resource technology

Development of biological, environmental, and hazardous substance monitoring systems and analysis technologies

Development of local self-reliant manufacturing technology and establishment of infrastructure

Development of zero-waste, upcycling products based on eco-friendly materials and environmental impact reduction technology

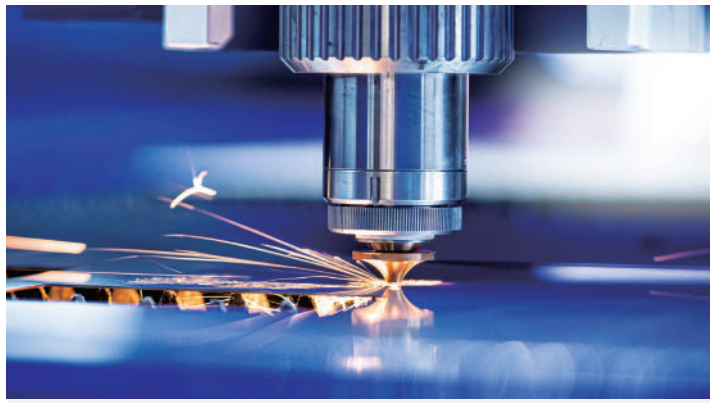
To effectively adapt to
evolving industrial paradigms and
bolster the competitiveness of
manufacturing technology,
KITECH administers specialized
government-commissioned centers
across various fields.

GOVERNMENT-COMMISSIONED CENTER

Our endeavors span from digitalization and
progressive enhancement of
manufacturing technology to technology
innovation, policy formulation, and
proposals aimed at fostering
eco-friendly industrial transformation.
We're dedicated to spearheading
the future of the industry by steering
strategic manufacturing technology
development initiatives on
a national scale.

GOVERNMENT-COMMISSIONED CENTER

KOREA NATIONAL PPURI INDUSTRY CENTER



www.kpic.re.kr

The Backbone of a Sustainable Material Industry

Since its establishment under the “Act on Promotion and Sophistication of Ppuri Industries,” the KPIC has been the driving force behind the research, development, and support projects essential for promoting and advancing the material industry.
This includes fostering industry safeguards, economic leaders, and talent cultivators.
The center is dedicated to creating a foundation for the development of material industries and enhancing the competitiveness of relevant companies by focusing on these key roles.

Main Activities

Cultivating talents and companies required for the material industry

Advancement of the material industry

Material industry R&D and revitalization

KOREA NATIONAL INSTITUTE OF RARE METALS

www.kiram.re.kr

Realization of a Safe Country with the Rare Metal Industry

The Korea Institute for Rare Metals fosters the rare metal industry and promotes key initiatives based on the law for establishing and operating a national rare metal center (Special Act on Strengthening Competitiveness of the Materials, Components, and Equipment Industry and Stabilizing the Supply Chain).
It also serves as a control tower to enhance the technological competitiveness of the domestic rare metal industry and stabilize the supply chain.

Main Activities

Establishment of rare metal industry policy

Building a foundation for the rare metal industry

Cultivating and supporting companies specializing in rare metals

Laying the foundation for international leadership by establishing a rare metal network

GOVERNMENT-COMMISSIONED CENTER

KOREA NATIONAL INDUSTRIAL CONVERGENCE CENTER

www.knicc.re.kr

Control Tower for Industrial Convergence Development and Expansion

In an era of full-scale convergence where the boundaries between physical, digital, and biological space disappear, the KNICC serves as a control tower for the development of national industrial convergence, including industrial convergence policy planning, information services, establishment of a cooperation system, and strengthening of corporate competitiveness.

Main Activities

Industrial convergence policy research and strategic planning

Response to industrial convergence regulations and difficulties

Creating a new market for industrial convergence and strengthening the convergence capabilities of small and medium-sized enterprises

Spreading industrial convergence culture and activating exchanges with affiliated organizations

KOREA NATIONAL ENGINEERING CENTER

ENG Bigdata

www.bigdata-eng.or.kr

Digital-based Engineering Industry Innovation

ENG Bigdata drives innovation in the engineering industry by acting as a leading research institute in high value-added manufacturing. It nurtures the engineering sector, enhances soft power capabilities, and fosters next-generation talents in new industries rooted in creativity and innovation.

Main Activities

Establishment of engineering industry promotion policy

Creating a manufacturing innovation ecosystem foundation for new industries

Developing a plan to build a cooperative network

GOVERNMENT-COMMISSIONED CENTER

KOREA NATIONAL CLEANER PRODUCTION CENTER

www.kncpc.or.kr

Establishment of a Cleaner Production System for an Eco-friendly Industry

The KNCPC, designated under the "Act on the Promotion of the Conversion into Environment-Friendly Industrial Structure," is a specialized organization dedicated to promoting cleaner manufacturing technology and transitioning to a carbon-neutral and circular economy in the industrial sector.
Its efforts ensure the sustainability of national industries, contributing to the establishment and development of an eco-friendly production system.

Main Activities

- Discovering industrial environmental policies
- Support for responding to international environmental regulations
- Promoting, disseminating, and supporting cleaner manufacturing technology
- Support for carbon neutral transition in the industrial sector
- Promoting a circular economy in the industrial sector
- Support for establishing a green management system

UST-KITECH SCHOOL

Cultivating Practical and Innovative Scientific and Technological Talents Who Will Lead the Future and Create Value

The University of Science and Technology(UST) is
a national research university established through the collaboration of government-funded research institutes.
It fosters creative talents through problem-solving education focused on research sites,
setting it apart from general universities.
Since 2004, KITECH has been operating the UST-KITECH School's master's and
doctoral programs to cultivate outstanding talents.
These programs leverage cutting-edge research equipment and facilities,
exceptional professors across various fields, and
participation in national research projects to contribute to industry development.

Majors at KITECH School

Manufacturing technology

The manufacturing technology major consists of three sub-majors aimed at cultivating skilled professionals in areas like robotics, industrial materials, smart manufacturing, clean processes, and energy systems.
These fields are integral to Korea's key industries and the advancement of the fourth industry.

Sub-Major	Robotics	Industrial Materials· Smart Manufacturing Engineering	Clean Process· Energy Systems Engineering
Description	Learning about robot technology being used in the field through multidisciplinary convergence research including mechanics, electricity, electronics, and IT	Provision of an opportunity to understand the virtuous cycle structure of rare materials through research on rare metals, ceramics, etc., and learning on manufacturing process design and optimization methods	Learning the areas of clean materials, processes, and high-efficiency energy technologies essential for transforming the domestic industrial structure into a low-carbon economic structure

Student Enrollment

For details,
refer to the UST website
(www.ust.ac.kr/eng/)

Admission Process	Admission Timeframe	Selection Steps
Ph.D. program	Latter half(around March)	1. Submission of application
master's program	Former half(around September)	2. Screening of documents
integrated program		3. Comprehensive interview for specialization
		4. Announcement of accepted candidates

GLOBAL NETWORK

KITECH Heading to the World, World Expanding through KITECH

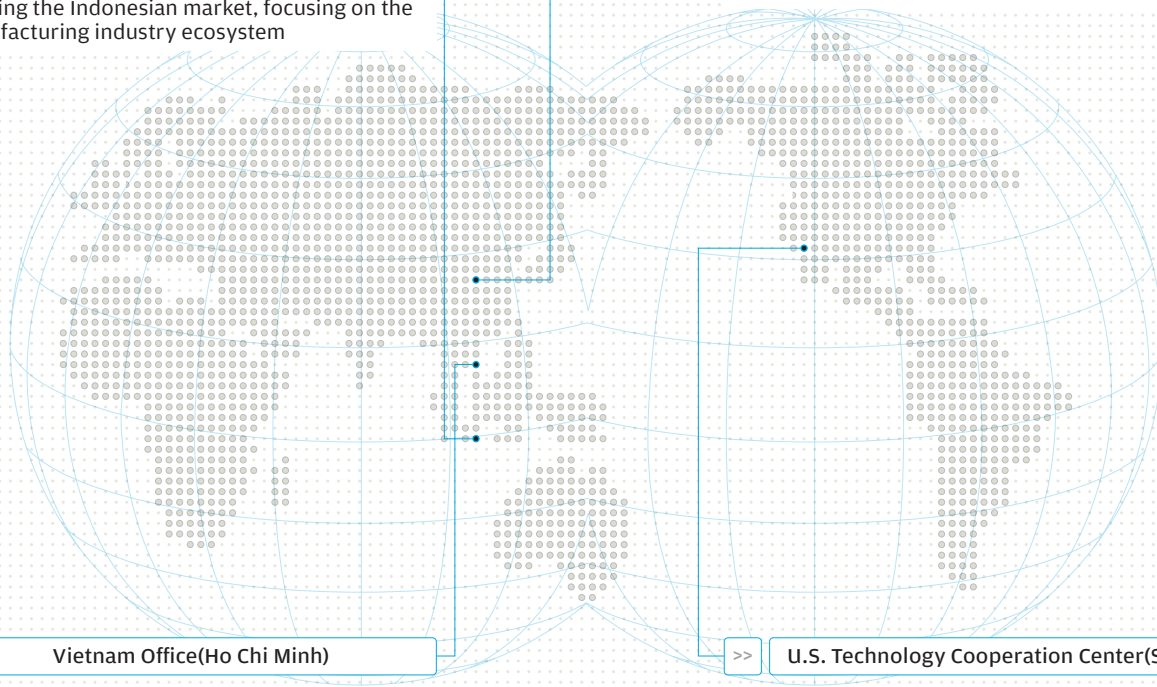
KITECH is facilitating the global engagement of Korean SMEs and
MMEs by establishing a diverse international network through overseas operations.
Through collaborative research with technologically advanced nations,
technical support for market entry abroad, and fostering conducive industrial environments,
KITECH stands as a dependable partner for Korean SMEs and MMEs with outstanding capabilities,
aiding them in successfully entering and establishing themselves in global markets.

>> Indonesia Office(Jakarta)

- Discovers the Korea-Indonesia industrial cooperation agenda based on the manufacturing industry and disseminates ASEAN science and technology
- Provides technical support and information on difficulties faced by Korean companies entering the Indonesian market, focusing on the manufacturing industry ecosystem

>> China Office(Qingdao)

- Activates technological cooperation networks with excellent Chinese research institutes and Korean scientists
- Supports customized technology for Korean companies operating throughout China, focusing on the digital manufacturing sector



>> Vietnam Office(Ho Chi Minh)

- Establishes joint research and a technical cooperation network with experts in Vietnamese industry, academia, research institutes, and government fields
- Implements customized on-site technical support programs for Korean companies entering the local market, focusing on electric mobility, textiles, and renewable energy fields

>> U.S. Technology Cooperation Center(San Jose)

- Discovers world-class joint research and builds a global network
- Serves as a global strategic focal point for Korea-US technological cooperation
- Support commercialization technology to improve global competitiveness of Korean companies operating in the US

>> INTERNATIONAL PARTNERS

Netherlands
- Energy Research Center of the Netherland
- Netherlands Aerospace Center

Norway
- The SINTEF Group

New Zealand
- The University of Auckland

Dominican Republic
- Export and Investments Center Dominican Republic

Germany
- Aachen University of Technology
- Dresden University of Technology
- Eidgenoissische Technology
- European Microtechnology Network
- Faunhofer Institute for Solar
- Fraunhofer Institute for Manufacturing Engineering and Automation
- Fraunhofer Institute for Material and Beam Technology
- Fraunhofer Institute for Software and System Engineering
- Fraunhofer Institute for Surface Engineering and Thin Films IST
- Fraunhofer-Gesellschaft
- German Aerospace Center(DLR)
- IFW Dresden
- Institute for Work an Technology
- Leibniz institute for Neue Materaialien gem. GmbH
- Leibniz University of Hannover
- Leibniz-institute for Solid and Materials Research, Dresden
- Max Planck Institute for Iron Research
- RWTH AACHEN UNIVERSITY
- The Technische University Munchen
- University of Cologne
- University of Duisburg-Essen

Latvia
- Institute of Solid State Physics, University of Latvia

Russia
- Far Eastern Federal University
- Siberian Federal University
- St. Petersburg State Polytechnic University

Lithuania
- Center for Physical Sciences and Technology

Mongolia
- Mongolian Institute of Physics and Technology
- Mongolian University of Science and Technology

USA
- Ames Laboratory
- Arizona State University
- Auburn University
- Britelab
- Centers for Advanced Vehicular Systems
- Cleveland Cavaliers
- Cornell University
- Edison Welding Institute
- Energy Systems Lab, The City College of New York
- Gas Hydrate Lab, Texas A&M University Kingsville
- Georgia Institute of Technology
- Georgia Tech Applied Research Corporation and EI Lighting Co. Ltd.
- Glassimetal Technology, Inc.
- Harvard Medical School
- Harvard University
- Hughes Research Laboratories
- IU Bloomington
- Johns Hopkins University
- Kent State University
- Korea-Sphere Advanced Materials Inc.
- Kymat Advanced Solutions
- Massachusetts Institute of Technology
- Michigan State University
- Mississippi State University
- National Institute of Standards and Technology
- National Renewable Engergy Laboratory
- Netherlands Organization for Scientific Research
- North Carolina State University
- Northwestern University
- Norwich University
- Nova Southeastern University
- Novelis
- Oak Ridge National Laboratory
- Oklahoma State University
- Pennsylvania State University
- Portland State University
- Purdue University
- Rensselaer Polytechnic Institute
- Standford Nanofabrication Facility
- Stanford University
- State University of California
- State University of NewYork
- Tennessee Technological University
- Texas A&M University
- The Bay Area K Group
- The George Washington University
- The Ohio State University
- The State University of New York
- The University of Maryland
- The University of Texas at Dallas
- UC Berkeley
- Uinversity of Colorado
- UL Solution
- University of California Berkeley
- University of California Davis
- University of California Merced
- University of California San Diego
- University of Central Florida
- University of Chicago
- University of Connecticut
- University of Illinois Urbana
- University of Lowa
- University of Michigan
- University of Nevada Las Vegas
- University of North Texas
- University of Tennessee
- University of Texas
- University of Toronto
- University of Utah
- University of Washington
- University of Wisconsin-Madison
- University of Wisconsin-Stout
- Washington State University

Vietnam
- Can Tho City Industry and Trade Department Socialist Republic of Vietnam
- Can Tho University
- Global Dyeing Co., Ltd
- Ho Chi Minh City University of Technology
- Ho Chi Minh City Department of Science and Technology of the Socialist Republic of Vietnam
- Institute of Materials Science
- Institute of Techonolgy Bandung
- Lam Dong Agro-Forestry Research
- Textile Research Institute
- University of Science and Technology of Hanoi
- University Science-VNUHCM
- Vietnam-Korea Institute of Science And Technology
- Vietnam Academy of Science and Technology
- Vietnam National University, Hanoi
- Vietnam Textile and Apparel Association
- Vietnam Textile Research Institute
- VNU University of Engineering and Technology

Belgium
- Interuniversity Microelectronics Center

Belarus
- Institute of Technology of Metals, National academy of Sciences of Belarus
- PLASMOTEG Center
- Skornia Gomel State University
- The State Committee on Sience and Technology of the Republic of Belarus
- Vitevsk State Technological University

Brazil
- Institute for Technological Research
- National Institute of Science and Technolgy for Pharmaceutical Innovation
- The Instituto de Pesquisas Technology

Saudi Arabia
- King Saud University
- King Saud University Riyadh Techno Valley

Sri Lanka
- Twinery

Sweden
- Business Sweden
- Chalmers University of Technology
- KTH Royal Institute of Technology
- Packbridge
- STFI-Packforsk
- The Pacaging Arena

Switzerland
- Fedral Material Testing and Research Institute in Switzerlan
- Swiss Federal Institute of Technology Zürich(ETH)

Singapore
- Institute of Chemical and Engineering Sciences
- National University of Singapore

Ethiopia
- Ethiopian Ministry of Education
- Textile Industry Development Institute On the Textile Industry Technological Cooperation

United Kingdom
- Brunel Centre for Advanced Solidfication Technolgy
- Brunel University
- University of Essex
- University of York

Uzbekistan
- Academy of Sciences of the Republic of Uzbekistan
- Institute of General and Inorganic Chemistry of the Uzbekistan Academy of Sciences
- Institute of Materials Science of the Uzbekistan Academy of Sciences
- Khokimyat Tashkent Region, JSC Almalyk Mining and Metallurgical Complex
- Ministry for Innovative Development of the Republic of Uzbekistan
- Ministry of Mining Industry and Geology of the Republic of Uzbekistan
- National University of Uzbekistan
- Physics-Sun
- Tashkent Institute of Textile and Light Industry
- The Instituite of Hydrogeology and Engineering Geology
- Uzagrotechsanoatxolding Joint stock company (ATS holding)
- Uzbek Research Institute of National Fibers
- Uzbekyengilsanoat

Ukraine
- Institute for Problems of Materials Science
- Kharkiv National University
- Kiev Polytechnic Institute

Iran
- Arak University
- Research Institute of Petroleum Industry

Israel
- Weizmann Institute of Science
- Yeda Research and Development Co.Ltd

Italy
- Italian Institute of Technology

Indonesia
- Center for Agro-Based Industry
- Center for Textile
- Center Institute of Energy-Conservation
- Center of Cheimical and Packaging
- Energy Solution Technolgy Co., LTD.
- Indonesia Textile Association
- Institute of Technology Surabaya
- Institute Teknologi Bandung
- IPB University
- LMAD Center
- Ministry of Industry of Republic of Indonesia
- Ministry of Marine Affairs and Fsherie of the Republic of Indonesia
- National Shipbuilding Engineering Design Center
- PT Barata Indonesia
- PT Pertamina Trans Kontinental
- PT. Growth JAVA Industry
- PT. Istana Cipta Sembada
- Research and Development Center for Oil and Gas Technology
- Universitas Padjadjaran
- University of Indonesia

Japan
- Akita University
- Hiyoshi Corporation
- Hokkaido University
- Kyoto University
- Nagaoka University of Technology
- National Institute for Environmental Studies
- National Institute for Materials Science
- National Institute of Advanved Industrial Science and Technology
- Osaka Metropolitan University
- Osaka University
- Precision and Intelligence Laboratory
- Ritsumeikan University
- Showa Denko
- The University of Tokyo
- Tohoku University
- Tokyo Institute of Technology
- Tokyo Metropolitan University

China
- China Academy of Machinery Science and Technology
- China Science and Technology Exchange Center
- Chinese Academy of Science
- Colleage of Material Science and Engineering
- Donghua University
- Harbin Municipal Government
- Jiangsu Industrial Technology Research Institute
- Nanchang University
- Shaghai Advanced Research Institute
- Shandong University of Science and Technology
- Shanghai Advanced Research Institute
- Shanghai Jiao Tong University
- Shanghai Yangtze Delta Innovation Institute
- Shenyan Research Institute of Foundry
- Shifangs
- University of Science and Technology of China
- Zhengzou Research Institute of Mechanical Engineering

Czech Republic
- Technology Agency of the Czech Republic

Kazakhstan
- Almaty Technological University
- JSC Institute of Metallurgy and Ore Beneficiation

Canada
- BWXT Nuclear Energy Canada Incorporated
- McGill University
- Ontario Tech University
- The Association of Korean-Canadian Scientists and Engineers
- The Consortium for Aerospace Research and Innovation in Canada
- The Uninversity of British Columbia
- Toronto Metropolitan University
- University of Windsor

Turkmenistan
- Ministry of Textile Industry of Turkmenistan

Pakistan
- Institute of Materials, Minerals & Mining Engineering
- Abbottabad University of Science & Technology

Poland
- Institute of Non-Ferrous Metals
- Lukasiewicz Research Network - Institute of Non-Ferrous Metals

France
- Ecole Polytechnique

Finland
- VTT Technical Research Centre of Finland

Hungary
- National Innovation Office of Hungary

Australia
- Commonwealth Science & Industry Research Organization
- Curtin University

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