KERI KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE

[Changwon Main Office]
12 Bulmosan-ro 10 beon-gil, Seongsan-gu, Changwon, Gyeongsangnam-do
TEL. + 82 55 280 1114 | **FAX.** 055 280 **1216**

[Ansan Branch Office]
111 Hanggaul-ro, Sangrok-gu, Ansan, Gyeonggi-do
TEL. 031 8040 4114 | **FAX.** 031 8040 4029

[Uiwang Branch Office]
138 Naesonsunhwan-ro, Uiwang, Gyeonggi-do
TEL. 031 420 6114 | **FAX.** 031 420 6009

www.keri.re.kr
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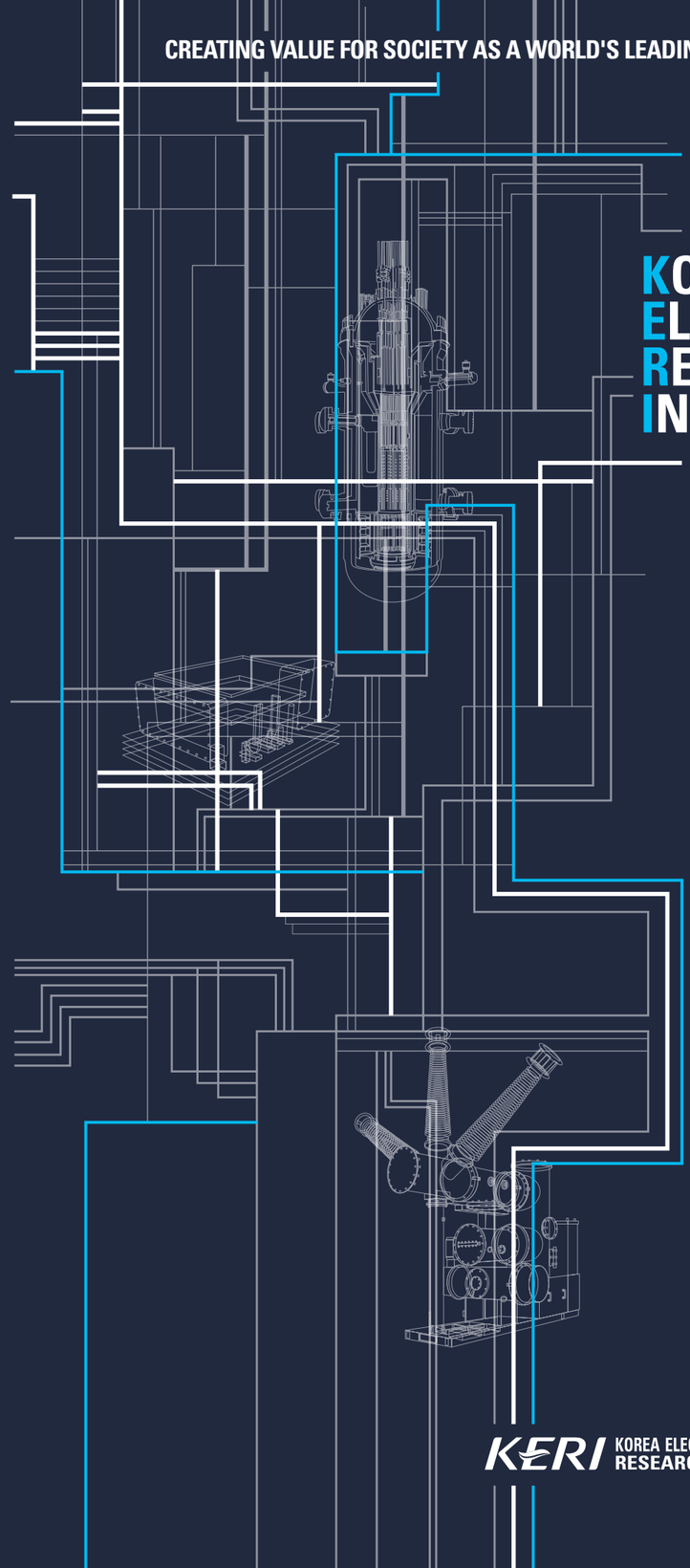
CREATING VALUE FOR SOCIETY AS A WORLD'S LEADING ELECTROTECHNOLOGY RESEARCH INSTITUTE

KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE

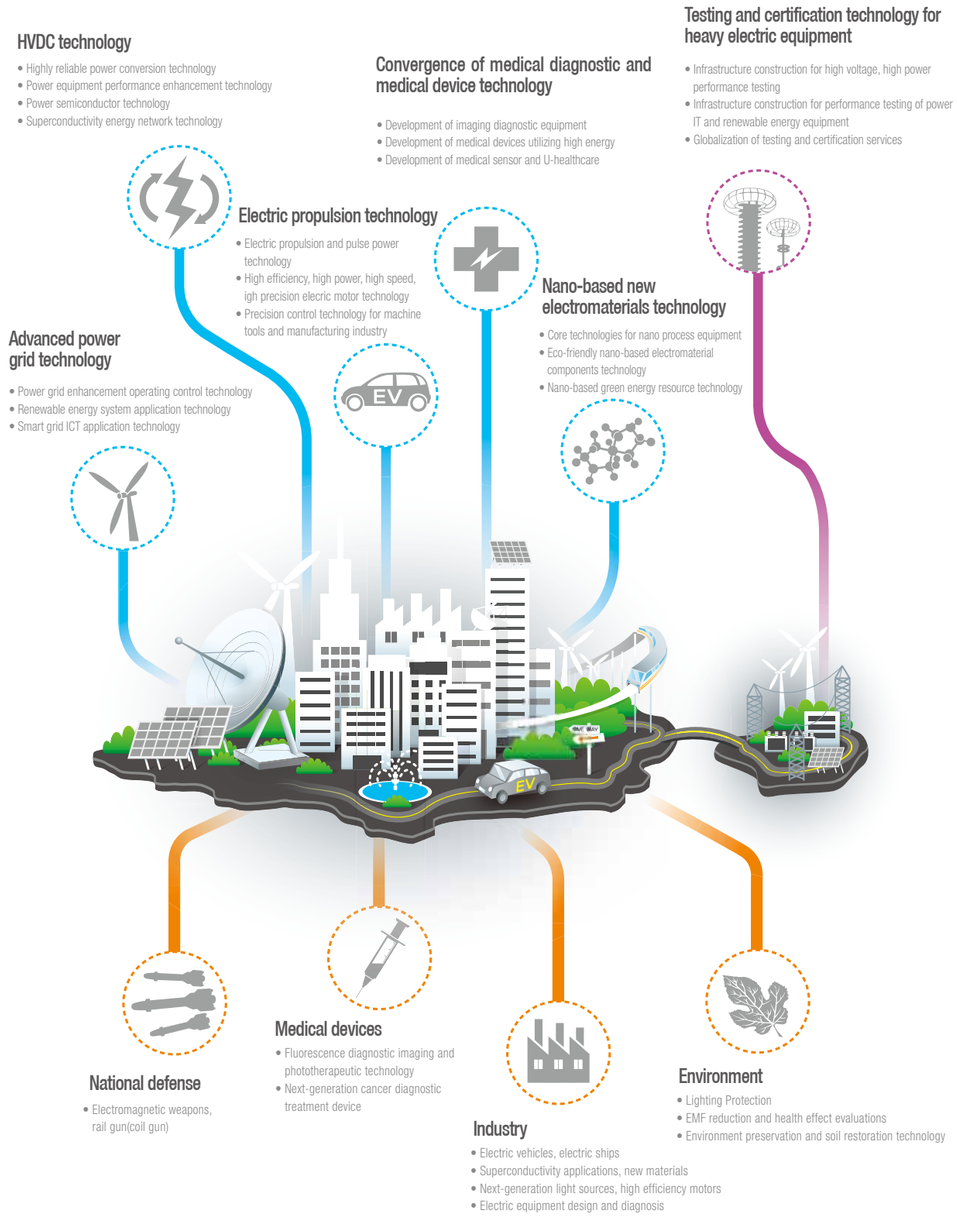


KERI KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE

Our research areas

KERI's advanced technology makes our dreams come true.

Electricity-based convergence technology
Electricity utilization technology
Testing and certification technology for heavy electric apparatus



KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE

Greetings,

KERI is a government-funded electrotechnology research institute under the National Research Council of Science & Technology of the Ministry of Science, ICT and Future Planning. Since our foundation as a state-authorized testing institution in 1976, we have made remarkable achievements over the years and emerged as one of the leading electrotechnology research institutes, with nearly 620 employees, two branch institutes in Uiwang and Ansan as well as our main office in Changwon, and one research center (Seoul RSS Center).

The history of KERI reflects the development of electrotechnology in Korea. We have successfully developed and transferred many original technologies hailed by industries, including the 765kV electric power facilities, next-generation energy management system (EMS), instrumentation and control (I&C) system for nuclear power plants, Korea Distribution Automation System (KODAS) technology, femtosecond laser light source technology, and magnetic levitation control system for maglev trains, contributing to national and industrial development We have also secured leading technologies in the fields related to public interests, which can compete with technologies of developed countries in the global market.

KERI is a state-authorized testing and certification institute specializing in electric power equipment and one of the world's three internationally accredited institutes that has become a full member of the Short-Circuit Testing Liaison (STL), which is known as the G10 of the heavy electric industry.

Adhering to our R&D philosophy, the priority of beneficiaries of results of our research should be mankind, society, institution and individuals and based on our implementation strategies of 'mission-centered', 'hybrid research organization', 'autonomy and responsibilities', 'convergence research', and 'efficient infrastructure investment', we will continue to strive to select valuable and feasible research projects expected to create large ripple effects and create remarkable achievements from our R&D activities for contributing to mankind and society.

Through such efforts, we will contribute to realizing a more convenient, happier, healthier and richer life of people by creating environments where we can use cutting-edge electric technology in an easier, safer, more convenient and more sustainable manner, while solidifying our position as a world's top-notch state-funded research institute beloved by people.

Thank you.

President of KERI

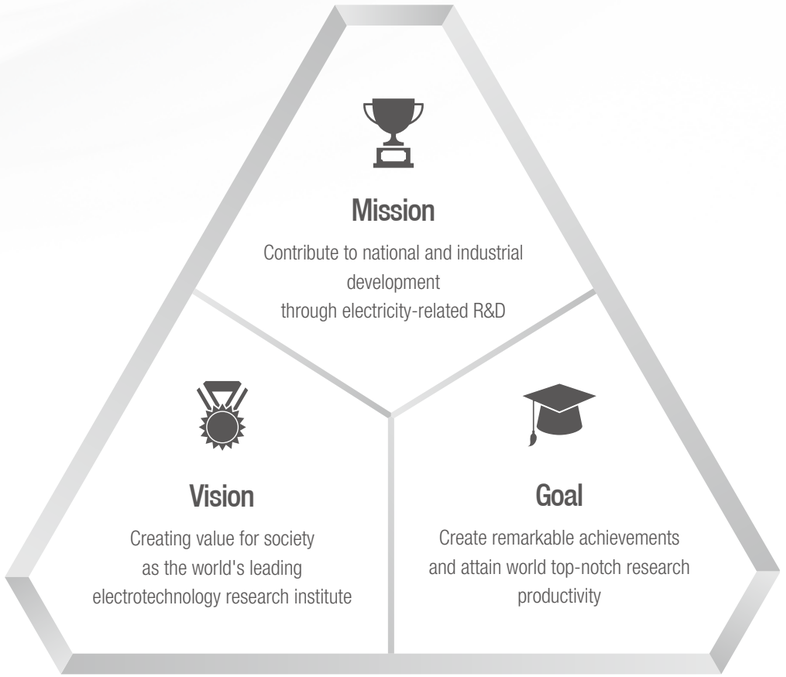
Kyungyop Park

Greetings from KERI President

Mission |

With an aim to contribute to national and industrial development as a state-funded research institute, KERI engages in R&D and dissemination of industrial original technologies, commercialization technologies and technologies for public interests in the fields related to electricity, and also provides testing and certification services in electricity-related fields.

Mission and R&D strategies |



Core values |

Performance — Ethics — Safety — Eco-friendliness — Efficiencies

Focus areas |

R&D · testing and certification

- Development of next-generation power grid for stable power supply
- Development of reliable electric apparatus technology for upgrading major industries
- Development of new electrofusion technologies for a 'creative economy'
- Industrial technology support for reinforcing the global competitiveness of the electric apparatus industry

Management

- Mission-oriented organization and personnel management
- Create transparent finance and ethical culture
- Strengthen systems for creating, utilizing and disseminating results
- Reinforce external communication and implementation of government policies
- Innovate research and testing operation system to create valuable and remarkable achievements

Changwon

Changwon Main Office

12 Bulmosan-ro 10 beon-gil, Seongsan-gu,
Changwon, Gyeongsangnam-do
TEL +82-55-280-1114
FAX +82-55-280-1216

01

- Site: 167,989㎡
- Building: 67,322㎡
- Facilities: Over 2,100 facilities, including 500/8000MVA high power testing facilities

KERI main office and branch office

Ansan

Ansan Branch Office

111 Hanggaul-ro, Sangrok-gu, Ansan, Gyeonggi-do
TEL +82-31-8040-4114
FAX +82-31-8040-4029

02

Uiwang

Uiwang Branch Office

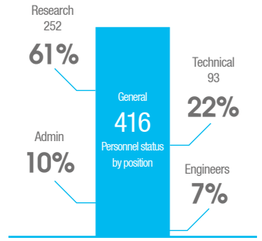
138 Naesonsunhwan-ro, Uiwang, Gyeonggi-do
TEL +82-31-420-6114
FAX +82-31-420-6009

03

Personnel and budget

Personnel status (as of . 2017)

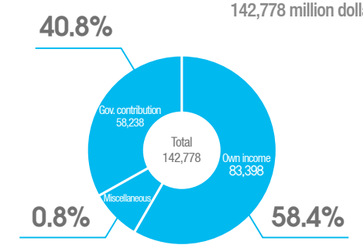
609 persons in total

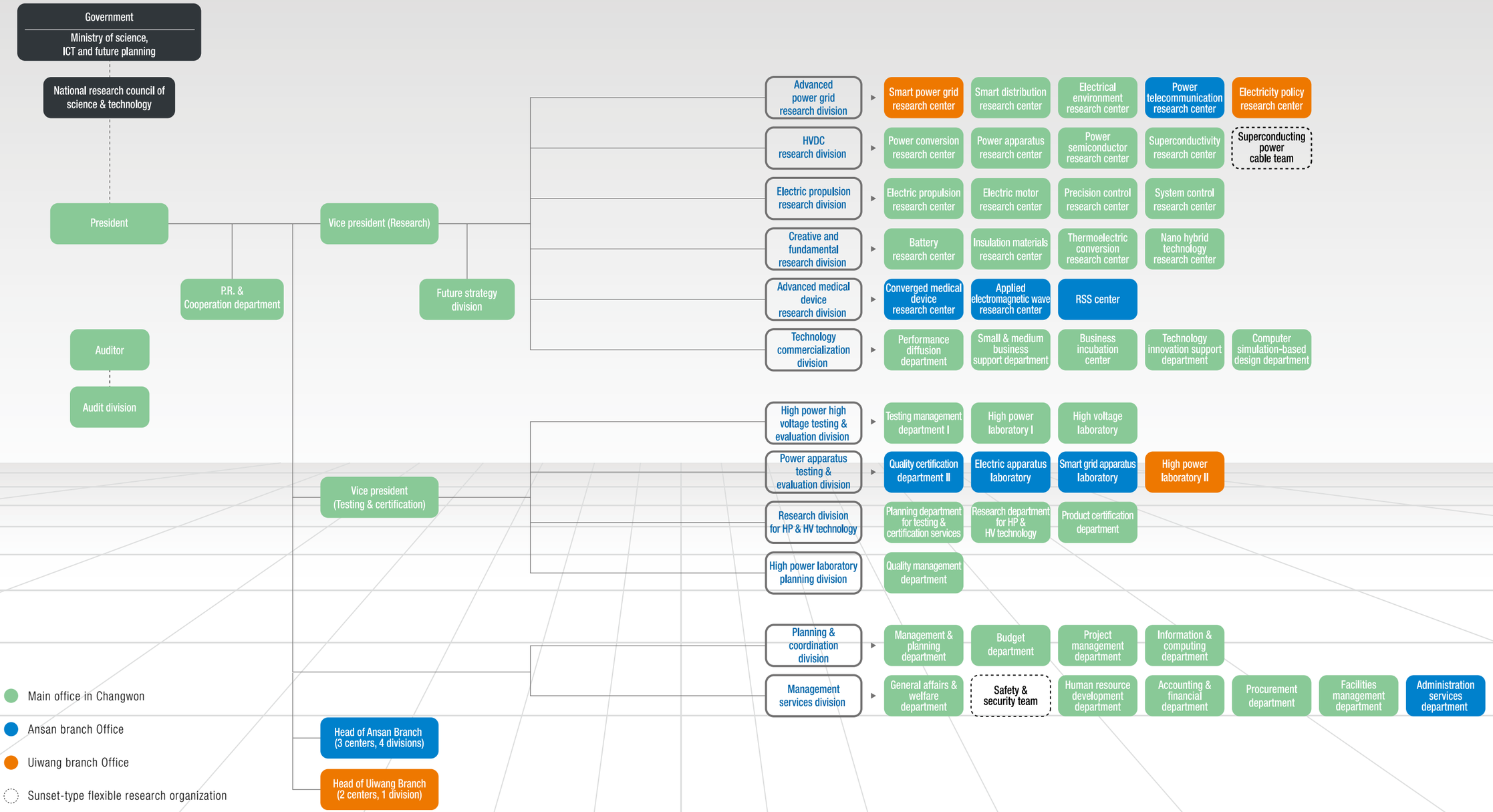


Budget [Income budget for 2017]

[Unit : million dollars]

Total budget
142,778 million dollars





Organizational chart

Organizational chart

1976 Pioneering (1976~1980)

01 (Dec. 29, 1976)
Established as the Korea Electric Research and Testing Institute

02 (1977)
Dr. Jeong Seong-gye inaugurated as the first president

03
The institute site before construction

04
Groundbreaking for the institute

05
The institute's apartment under construction

KERI was established as the result of united efforts by the government, industry, and university to develop the nation's electric power business and electric industry.

01 (1987)
Groundbreaking for the second research building

02 (1989)
Completed the institute's apartment

03 (1989)
Completed the framework of the low and medium voltage research building completed

04 (1990)
Developed and demonstrated KOMAG-01 (maglev train)

05 (1992)
Completed the synthetic testing facilities

KERI established the foundation for growth and development by securing modern research and testing equipment and a large number of skilled research workforce.

01 (1998)
Signboard hanging for KOLAS

02 (2000)
Completed 500MVA short circuit test facilities in Uiwang

03 (2001)
Renamed as Korea Electrotechnology Research Institute (KERI)

04 (2003)
Developed and demonstrated reactor control rod control system

05 (2007)
The 30th anniversary of KERI company foundation

KERI has secured the best-in-class technology power as an electrotechnology hub leading national growth engines.

01 (2015)
2MW (±10kV 100A) HVDC converter station

02 (2015)
Printed flexible electrode manufacturing technology

03 (2016)
Completion of building additional 4000MVA high voltage test facilities and establishing integrated operation system

04 (2016)
80kV 8kA DC circuit breaker

05 (2017)
Technology for monitoring and planning of national power grid reliability

KERI aims to cement its position as a world top-notch electrotechnology research institute creating values through remarkable performance.

1981 Challenge (1981~1986)

01 (1981.1.20)
Established as the Korea Electrotechnology and Telecommunications Research Institute

02 (1980)
Testing facilities installed in Changwon Main Office

03 (1981)
Short-circuit generator delivered into the institute

04 (1982)
Completed the high voltage assembly chamber

05 (1985.6.17)
Separated as the Korea Electrotechnology Research Institute

Overcoming many challenges such as a merger, KERI entered into a new era as the nation's only total research institute related to electricity.

1987 Infrastructure construction (1987~1992)

01 (1993)
Completed the cable research and testing center

02 (1995)
Announced the outcome of 765kV metal fittings development

03 (1996)
Transfer of power conversion technology

04 (1996)
Announced the outcome of superconductivity MRI research

05 (1997)
Completed the third research building

1993 Structure for self-growth/ leap (1993~1997)

KERI established the structure for self-growth by accumulating material technologies and know-how related to research and testing.

1998 Leader in electricity technology (1998~2007)

01 (2008)
Completed the Ansan Branch Office

02 (2011)
Acquired full membership of the Short-Circuit Testing Liaison (STL)

03 (2014)
Groundbreaking for extension of 4000MVA high voltage testing facilities

04 (2014)
Localization of advanced EMS

05 (2014)
Developed femtosecond laser for industrial use

KERI has contributed to national and industrial development through R&D activities in the field of electricity.

2008 New renaissance (2008~2014)

2015 Remarkable performance (2015–)

Awards and achievements

R&D

- Selected as 'Top 10 Achievements' (Core Device Technology for the protection from HPEMP) [Ministry of Science, ICT and Future Planning] **2017**
- Selected as 'Top 100 Achievement in Government R&D Projects' (SiC power semiconductor technology, DC breaker for high voltage high current) [Ministry of Science, ICT and Future Planning]] **2016**
- Selected as 'Top 10 Achievements' (SiC power semiconductor technology) [Ministry of Science, ICT and Future Planning]..... **2015**
- Selected as '70 Selected Technologies Commemorating the 70th Anniversary of Independence' (Localization of 765kV power equipment) [Ministry of Science, ICT and Future Planning] **2015**
- Selected as 'Top 10 Research Achievements by Government-funded Research Institutes' (femtosecond laser) [Ministry of Science, ICT and Future Planning] **2014**
- Three technologies selected as '100 Selected Achievements of National Research and Development' [Ministry of Science, ICT and Future Planning] **2014**
- Three individuals selected as 'Leaders for 100 Selected Future Technologies for Korean Industries' [The National Academy of Engineering of Korea] **2013**
- Ranked first in government-funded research institutes with high research productivity [National Research Council of Science & Technology] **2013**
- Selected as 'Best Practice for Intellectual Property Commercialization' [Korean Intellectual Property Office] **2013**
- Awarded grand prix at 'Dasan Technology Award' (Superconductivity cable) [The Korea Economic Daily] **2012**

Testing and certification

- Awarded the Minister for Trade, Industry and Energy Award as a KAS product certification agency **2015**
- Acquired qualification as an international certified testing and certification institute in the field of smart grid communication conformance client [UCAIug] **2014**
- Acquired qualification as an IECEE international test institute in the field of mid-and large solar inverter **2014**
- Acquired qualification as a certified testing and certification institute in the field of IEC 61850 communication conformance server [UCAIug] **2013**
- Acquired full membership of the Short-Circuit Testing Liaison (STL) **2011**

Institute management

- Selected as 'Excellent Institution' in '2017 Institutional Evaluation' [Ministry of Science, ICT and Future Planning] **2017**
- Awarded 'Excellent Exhibition Award' in Korea Tech Show [Ministry of Commerce, Industry and Energy] **2016**
- Awarded Grand Prize in the Institute Division in 'Small and Medium-sized Enterprise of Merit' [Small and Medium Business Administration] **2016**
- Awarded 'Excellent Institute in Technology Commercialization' [Korea Institute for Advancement of Technology] **2016**
- Selected as 'Top 10 Institute in Technology Transfer, Commercialization and Start-up' [Ministry of Science, ICT and Future Planning]..... **2016**
- Awarded the Minister for Trade, Industry and Energy Award for excellence in SME support [Ministry of Trade, Industry and Energy] **2015**
- Awarded the Excellent Institute for Technical Transfer and Commercialization Award [Ministry of Trade, Industry and Energy] **2014**
- Awarded the Excellent Institute for Public Sector Human Resource Development Award [Ministry of Government Administration and Home Affairs, Ministry of Education] **2014**
- Awarded the Korean Donation for Education Award [Ministry of Education] **2013**
- Acquired Grade A in Evaluation of Operation of Business Incubation Center [Small and Medium Business Administration, Changwon Government] **2012**

KERI's top 10 achievements

01 765kV Electric facilities

Project manager : Yang Gwang-ho
Development year : 2003

- The world's first commercialization of 765kV 3-phase 2-line transmission line
- Localization of the design, construction and maintenance technologies for 765kV transmission and substation facilities

02 Energy management system (EMS)

Project manager : Lee Jeong-ho
Development year : 2014

- Power IT-based advanced EMS (world's 5th)
- Localization of EMS technology

03 Reactor control rod control system for power plant

Project manager : Kwon Soon-man
Development year : 2006

- The nation's first localization and commercialization of the primary system core control system of nuclear power plants
- Enhanced plant availability with redundancy-based function of preventing the influence of single point failure

04 Korea Distribution Automation System (KODAS)

Project manager : Kim Ho-yong (Oh Sang-gi)
Development year : 1997

- Development of KODAS and its application to real grids
- Enhanced power reliability by minimizing outage regions and time

05 Femto-second laser for industrial applications

Project manager : Kang Wook (Kim Gwang-hoon)
Development year : 2014

- Localization of femtosecond laser for advanced ultrafine processing
- Securing of international competitiveness of the domestic laser industry and applied technologies

06 Levitation control system for magnetic levitation vehicle

Project manager : Kim Chungyeong
Development year : 2000

- Development of Magnetic Levitation & Propulsion Control System for Magnetic Levitation Vehicle

07 Silicon carbide power semiconductors

Project manager : Kim Nam-Kyun
Development year : 2015

- Development of SiC power semiconductors for high efficiency power electronic system
- Securing the technologies for power semiconductor related market as a new growth engine

08 DC circuit-breaker for HVDC

Project manager : Lee Woo-young
Development year : 2015

- High-speed DC breaking technology to block power flow within 0.002 seconds
- Solved the biggest problem in DC transmission and renewable energy transportation

09 Extension of 4000MVA class high-power test facility

Project manager : Kim Maeng-hyun
Development year : 2016

- Solved the problem of capacity shortage and chronic congestion in testing
- Enhanced international competitiveness through the export and globalization of heavy equipment

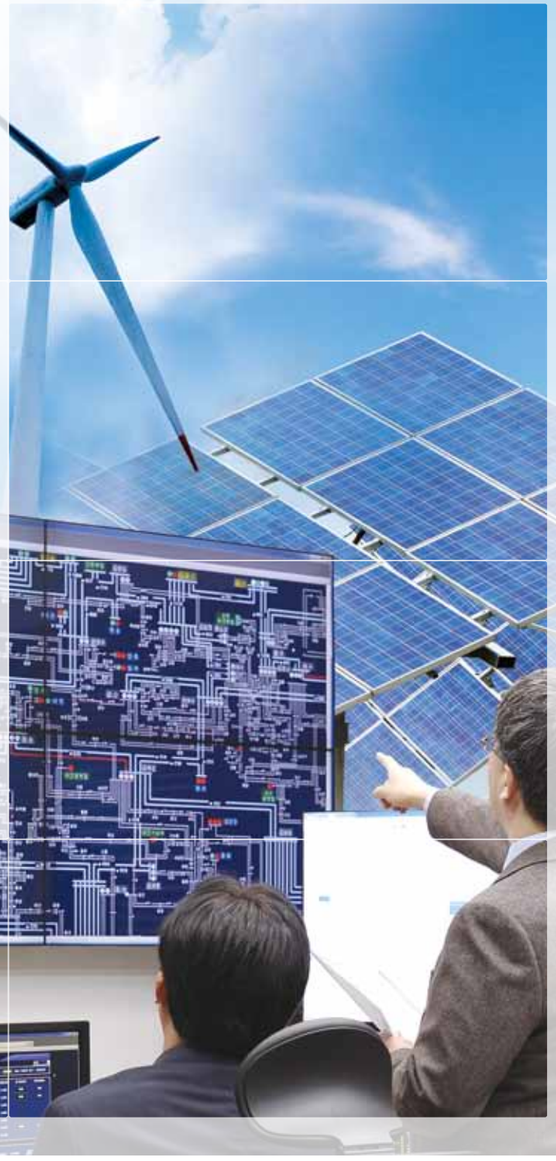
10 Development of digital AVR for power plants

Project manager : Kim Gook-heon
Development year : 2016

- Localization of digital excitation control system for 500MW-class power plants
- Technology independence in the design/manufacture/evaluation/test/trial-run/maintenance of the excitation control system

Advanced electric technology

Advanced power grid research



The issue of greenhouse gases (GHGs) is the largest challenge faced by mankind in the 21st century. In effort to overcome this, the Korean government launched and has implemented a green growth strategy in which it established a GHG reduction roadmap to expand the use of renewable energy and reduce the use of fossil fuels.

In line with this, in the field of advanced power grid research, we are focusing on the development of reliable, green and intellectual power grid technologies, which are required by the digital society in the 21st century.

More specifically, we are currently engaging in research on future smart grid architecture including renewable energy, which has been aggressively promoted by the government, as well as national power grid planning and operation technology, IT convergence power telecommunication technology, electric environmentally-friendliness technology and integrated resource management.

Smart power grid research

T +82-31-420-6140 E leejh@keri.re.kr

We have conducted R&D on core technologies for optimal operation and planning of a future national power grid to enhance the reliability of power grids in new energy environments.

Major research areas

- Advanced energy management system (EMS) technology
- Power system reliability monitoring and assessment technology
- Generator dynamic characteristic testing and modeling and power system simulation technology
- Superconductivity transmission cable protection control technology
- Energy storage system application, cyber security, real-time power system protection control technology

Smart distribution research

T +82-55-280-1301 E chcho@keri.re.kr

We conduct research on the engineering technology development and commercialization for the design and operation of distributed future power grids based on distributed resources and renewable energy system.

Major research areas

- Technology for connecting distributed resources and renewable energy systems with power grids
- Technology for applying energy storage system (ESS) to power grids
- Microgrid design and operation technology
- Technology and standardization of smart distributed resources engineering

Electric environment research

T +82-55-280-1302 E jblee@keri.re.kr

We develop technologies required to respond to the growing demand for the safety of major government facilities and industrial facilities and pleasant life environment, and tightening regulations on EMF environment and pulse protector tolerance.

Major research areas

- Technologies for environmentally-friendly power facilities such as HVDC/HVAC transmission lines, power plants and substations, conversion stations and renewable energy
- Lightening protective design and countermeasure technology
- EMF exposure assessment and reduction technology, EMP / EMI technologies
- Technology for design and manufacturing of transmission equipment and materials for high voltage transmission lines

Power telecommunication research

T +82-31-8040-4101 E sschoi@keri.re.kr

We conduct R&D on energy integration network technology based on reliable power telecommunication to lead technologies for advanced intellectual power telecommunication networks.

Major research areas

- Smart grid ICT technology and energy web technology
- Smart substation process bus network devices and application technologies
- Reliable signal transmission for industrial use and advanced power telecommunication technology
- AMI wired/wireless communication and energy demand response technology

Electricity policy research

T +82-31-420-6121 E kscho@keri.re.k H www.eprc.re.kr

We conduct technology feasibility study, policy and program development and system development study in major areas of the electric power industry such as power supply and demand, energy efficiency improvement, demand response, and renewable energy policy.

Major research areas

- Power supply and demand analysis technology
- Demand resource evaluation and DR design technology
- Energy efficiency improvement policy and performance evaluation technology
- Renewable energy policy and system development

HVDC research

With the spread of renewable sources worldwide and the growing necessity of international grid connection, the demand for reliable long distance power transmission is increasing.
Korea is also preparing for introducing HVDC technology as part of its efforts to stabilize power supply and demand and resolve the issue of building additional transmission lines.
Our HVDC division is actively engaging in the development of core HVDC technologies such as power conversion, electric devices, power semiconductor and superconductivity technologies for highly reliable power supply.

Power conversion research

T +82-55-280-1601 E jwbaek@keri.re.kr

We are pioneering new transmission technology areas, including power conversion devices for HVDC, DC distribution system, renewable energy and grid-connected power conversion system.

Major research areas

- GW-level MMC-HVDC control platform technology
- Core technologies for DC distribution and feeding facilities
- Power conversion system for renewable energy and smart grid

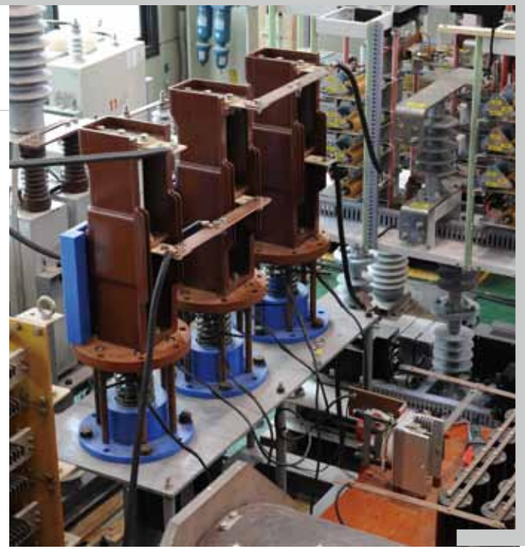
Power apparatus research

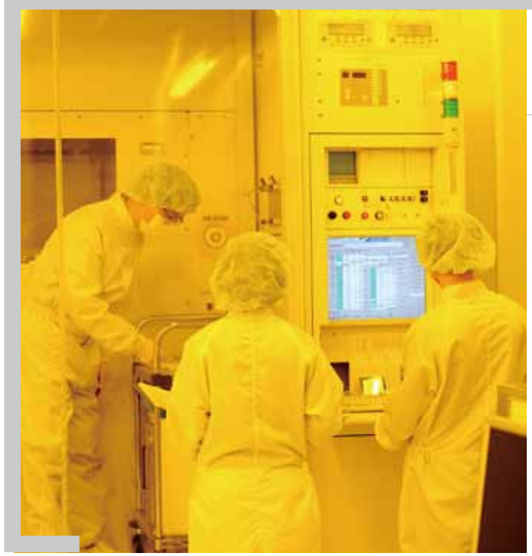
T +82-55-280-1602 E wylee@keri.re.kr

We conduct R&D on power apparatus technologies for DC transmission methods and technologies related to new power apparatuses to verify the integrity of power facilities in operation and secure their environmentally-friendliness.

Major research areas

- HVDC circuit breakers
- Green gas AC high voltage circuit breakers and switches using new insulation medium
- Technologies for estimating the integrity of power facilities and monitoring and diagnosing their condition





Power semiconductor research

T +82-55-280-1621 E bahng@keri.re.kr

Semiconductors are an essential part of HVDC technologies and technologies for connecting renewable energy with power grids. Our R&D focus is on developing power semiconductors with superior electrical properties and minimized power loss.

Major research areas

- High voltage and low loss advanced power semiconductor technology
- Power semiconductor integrated circuit (Power IC) technology

Superconductivity research

T +82-55-280-1604 E dwha@keri.re.kr

We conduct R&D on applications of low loss and high efficiency superconductivity technology, such as electric energy transmission and storage equipment and medical and industrial high-field magnet.

Major research areas

- Superconducting cable and wire technology
- Superconducting magnets
- Superconducting power apparatus development

Electric propulsion research

We strive to develop and disseminate technologies for enhancing technical competitiveness of major industries in Korea.
The technologies we are currently developing include high voltage/high current pulse power application technologies for manufacturing and national defense, precision/high power mechatronics technology for advanced manufacturing and robotic technologies, electric propulsion technology based on motor power for environmentally-friendly electric ships and vehicles, and high efficiency and high speed motor technologies for energy reduction.

Electric propulsion research

T +82-55-280-1453 E jskim@keri.re.kr

We conduct R&D to commercialize environmentally-friendly electric propulsion technology and advanced high voltage high current pulse power technology.

Major research areas

- Electric vehicle chargers, charging infrastructure and electric vehicle-related technologies
- Electric energy-based national defense application technology
- High voltage/high current pulse power and industrial application technology

Electric motor research

T +82-55-280-1402 E bcwoo@keri.re.kr

We conduct R&D on improving the efficiency of motors and generators, which represent over 20% of the nation's total energy consumption, compact high speed/high power design technology and drive control technology.

Major research areas

- Copper die-cast premium motors and Minimum Energy Performance Standard (MEPS)-applied 3-phase high efficiency induction motors
- High speed motors and generator systems for national defense and industrial use
- High power motors and motor drive systems for electric vehicles (EVs)
- Magnetically levitated clean transmission and large capacity wind generation system
- High power/high torque motor application systems for robotics and private/military sectors

Precision control research

T +82-55-280-1403 E hjkim0429@keri.re.kr

We are engaging in R&D to improve national competitiveness based on original precision control technologies.

Major research areas

- Open network platform for control
- Supervisory control system applicable to robotics and machine tools
- Multi-axis robotics application technology
- High speed high precision control algorithm
- IoT-based smart factory technology

System control research

T +82-55-280-1404 E ckkim@keri.re.kr

We researches electric propulsion systems in order to develop the core technology for intelligent plants, which maximize their efficiency by integrating ICT combined with digital automation solutions into the entire production processes to optimize the production system as well as the high reliability of electric ships.

Major research areas

- Development of core equipment and application software for the smart factory
- Analysis and design technology for electric ship propulsion system/power system
- System control technology that integrates engineering and parts technology

Creative and fundamental research

Creative and Fundamental Research Division is conducting R&D on materials and process technologies essential to the electricity industry, including advanced batteries, insulation materials for power apparatuses, energy conversion materials, new carbon-based electrode materials, and nano process technology.

One of the advantages of this research is that it can be collaborated with another research division in the institute, which focuses more on the application and industrialization of materials, enabling more practical research.

Battery research

T +82-55-280-1663 E sangma@keri.re.kr

Battery Research Center is a group specializing in technologies for the storage, conversion and generation of electric energy. We conduct R&D for improving the performance and safety of lithium batteries by developing four major materials for lithium secondary batteries (cathode material, anode material, electrolyte and separators) and all-solid state batteries, while endeavoring to develop advanced sources of energy to maximize the safety, power and energy density of batteries, such as sodium secondary batteries and super capacitors. Furthermore, we are expanding the scope of research to areas utilizing secondary batteries, such as the development of secondary battery evaluation methods/international standards and energy harvesting material/devices.

Major research areas

- Core materials: Materials for lithium secondary batteries, super capacitors and metal-air batteries
- Lithium battery system : All-solid state secondary battery
- Non-lithium battery system : Sodium secondary batteries, super capacitors, metal-air batteries, Ferroelectric ceramic capacitors
- Technologies for utilizing secondary batteries : Evaluation basis, international standards
- Electric energy conversion materials and systems : piezoelectric materials and devices, energy harvesting materials/devices, piezoelectric actuators

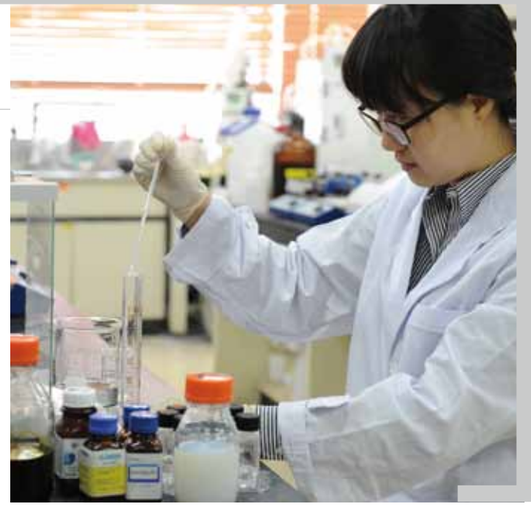
Insulation materials research

T +82-55-280-1502 E hypark@keri.re.kr

We conduct research related to the development and application of various insulation materials used for high voltage power apparatuses and electric and electronic products.

Major research areas

- Nano hybrid insulation coating materials for motors and transformers
- Nano hybrid insulation materials for power apparatuses and transformers
- High voltage insulation materials
- Hybrid materials for organic plastic film protection
- Insulation material process technology and characteristic evaluation technology



Thermoelectric conversion research

T +82-55-280-1503 E bskim@keri.re.kr

Thermoelectric Conversion Research Center aims to become a global research group conducting comprehensive study of thermoelectric materials and devices and thermoelectric conversion systems.

Major research areas

- Technology for design and property analysis of thermoelectric materials utilizing quantum simulation
- Transport properties simulation technology / homogeneous thermoelectric nanoparticles manufacturing technology
- High efficiency, reliable thermoelectric device manufacturing technology / Micro thermoelectric device manufacturing technology
- Thermoelectric material and device property measuring standardization technology / Thermoelectric property measuring equipment manufacturing technology
- Thermoelectric power generation system utilizing industrial waste heat and automobile exhaust heat.

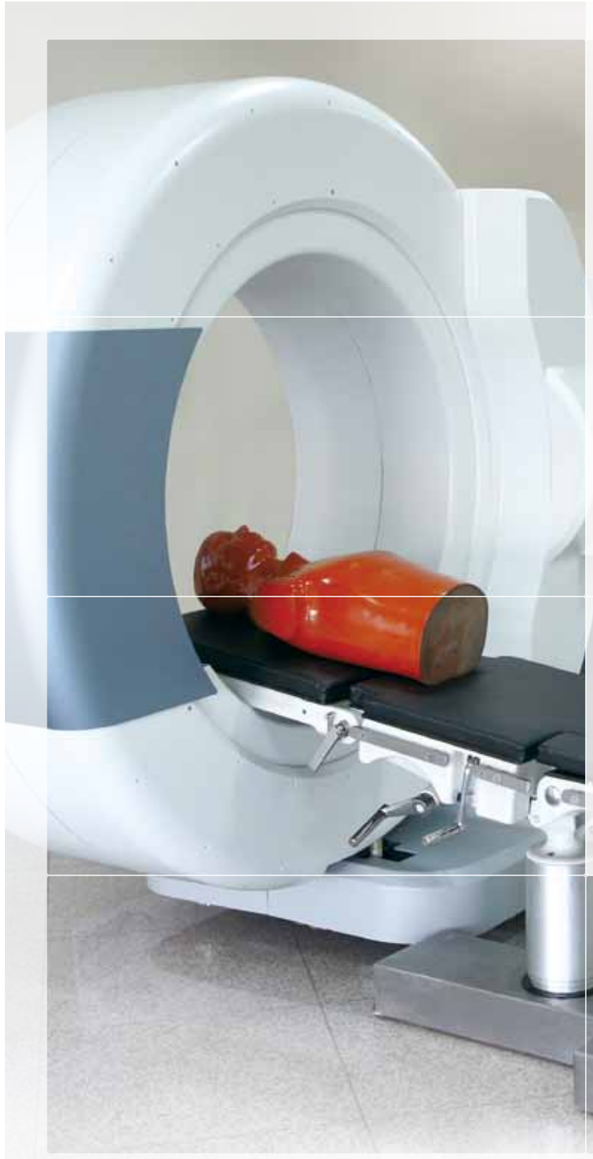
Nano hybrid technology research

T +82-55-280-1678 E jthan@keri.re.kr

Nano Hybrid Technology Research Center is conducting R&D to become the world's best research group in the field of nano hybrid materials, devices and electric parts.

Major research areas

- Carbon nanutube and graphene hybrid material manufacturing technology / Highly flexible dye-sensitized solar cells
- Carbon nanomaterial metal hybrid high conductivity material technology
- Nano device for flexible substrate manufacturing technology / Microwave nano-heating application technology
- Conductive textile manufacturing technology and textile wearable device application technology
- Imprint technology for AR (anti-reflection) / super water-repellent surface manufacturing
- Fine pattern fabrication technology for transparent flexible elements



Advanced medical device research

Advanced Medical Device Research Center conducts R&D on technologies for diagnosing and treating internal and external lesions by applying electric energy control technology to clinical medical technologies.

We are conducting R&D on core systems for medical imaging diagnostics and treatment technologies, such as MRI, CT, optical medical imaging, medical laser and radiodiagnosis treatment systems as well as advanced electronic medical equipment combining IT, BT and NT.

For this, we have partnerships with domestic large hospitals for joint research, and strive to establish R&D system for medical devices focused on advanced medical technologies through transitional research with medical device suppliers.

Advanced Medical Device Research Center will endeavor to take the initiative towards the development of converged medical device technologies hailed as a future industry based on superior human resources and research facilities, to improve human health and life and evolve the medical industry into a new growth engine.

Converged medical device research

T +82-31-8040-4125 E yjpark@keri.re.kr

We develop cutting-edge converged medical technologies and devices combining ICT, NT and BT, to create the nation's future growth engine in the field of advanced medical devices and improve the welfare of people.

Major research areas

- Custom smart hearing aid technology
- Semiconductor-based radiographic imaging sensor technology
- BT-IT-NT convergence bio-sensing and healthcare technology
- High efficiency magnetic resonance wireless power transmission and charging technology

Applied electromagnetic wave research

T +82-31-8040-4168 E khlee@keri.re.kr

We aim to develop electromagnetic light sources such as electron beams, laser, THz, and X-ray, and advanced medical diagnostic devices and treatment devices using such light sources.

Major research areas

- Medical femtosecond laser and application technology
- Accelerating tubes and magnetrons for MR image-guided LINAC treatment systems
- Preclinical special CT and biofluorescence convergence imaging technology
- 3D DBT/DOT imaging and auto legion detection system
- THz vacuum device and high speed high resolution THz imaging system

Optical medical device research

T +82-31-8040-4102 E sojin@keri.re.kr

We conduct international joint research in the fields of medical-bio and laser-optical-electric technology, together with Russian research institutes and companies possessing the world's best original and basic technologies in the field of imaging and optical science based on electric and electronic control and commercialization technologies.

Major research areas

- Medical electronic endoscope technology
- Advanced imaging medical device and light source convergence system technology
- Guided or self biofluorescence real-time monitoring technology

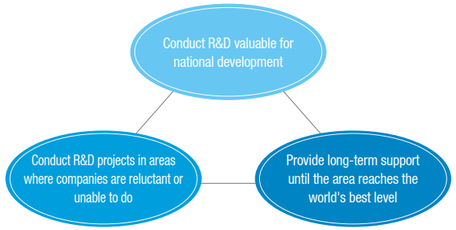
KERI's R&D initiatives

Research project priority

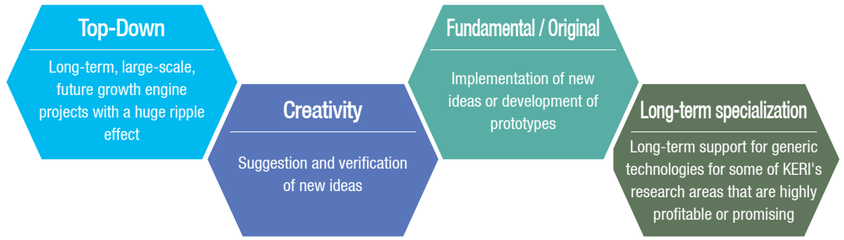
[Target to benefit]

Mankind 〉 Society 〉 Institute 〉 Individual

R&D implementation direction



R&D project classification



Priority projects (Top-down)

Project name	Upper category
Development of core technologies for optimal operation and planning of a future national power grid	Next-generation power grid research
Implementation of smart substation process bus and development of application technology	
Development of intelligent micro grid energy network technology	
Development of technology for protection from power electromagnetic pulse (HPEMP)	
Development of GW-level MMC-HVDC control platform technology	HVDC research
Development of core technologies for 250kV/2.5GW superconductivity cable for HVDC	
Development of next-generation power device based on high voltage, high current density SiC	
Development of smart actuator for robotics/automation	Electric propulsion research
Development of precision control system control technology for machine tools	
Development of IoT-based core equipment and application software technology for CNC machining smart factory	
Development of nano carbon-based 10^5 S/m class flexible electrode for next generation smart devices	Creative and fundamental research
Development of transparent electrode/wiring electrode integrated substrate for high-flexibility soft light emitting devices	
Development of high reliability medium to large lithium rechargeable battery system for electric ships	
Development of nano composite insulation material for mold transformers	
Development of LINAC and magnetron for cancer treatment	Advanced medical device research
Development of medical femtosecond laser and application technology	
Development of user-friendly wireless communication convergence smart hearing aid technology	
Development of medical electronic endoscope system	
Development of long-range wireless power transmission technology	

KERI's R&D direction

Testing and certification

Main testing and certification services

Inside booklet : KERI's testing facilities

32 Inside booklet

Testing and certification

KERI is a certified independent testing and certification institute that adheres to ISO/IEC standards. We provide comprehensive testing, inspection and certification services for heavy electric equipment ranging from low voltage to high voltage products to global customers, with world-class testing facilities and testing and certification systems that meet international standards.

Currently, KERI is Korea's only KOLAS testing and inspection institute accredited by the Korea Laboratory Accreditation Scheme (KOLAS), which signed the Mutual Recognition Agreement (MRA) of the International Laboratory Accreditation Cooperation (ILAC), KAS product certification institute accredited by KOLAS, Italian ACCREDIA product certification institute, and CB certification and testing institute accredited by IECEE, and is a full member of the Short-circuit Testing Liaison (STL). As a result, KERI test reports and certificates are recognized not only in Korea but also in all the member countries around the world.

Testing business

KOLAS STL IECEE UCA

Test types

- A type test to verify if the design, fabrication and material of a newly developed product meet standards such as IEC.
  - General type test, KS certification and safety certification test, KAS certification test, STL certification test, IECEE certification test, IEC 61850 communication conformance test
- A routine test to verify the performance of the electric apparatus for its manufacturer or user to sell or purchase it
- A test conducted in preparation for pre-inspection for private users of electric installations in accordance with the Electric Utility Act
- A performance test in accordance with specifications or standards required by the client to verify the performance of the product or its parts.

Main products subject to testing | Changwon Main Office

Testing management department I T +82-55-280-2401 E hpl@keri.re.kr | High voltage laboratory T +82-55-280-2403 E hvl@keri.re.kr

Switches (switchboards), Circuit breakers, switches, disconnecting & grounding switches, transformers, fuses, cables, arresters, insulators and bushing, motors, solar inverters, batteries, etc.

Main products subject to testing | Ansan and Uiwang Branch Offices

Electric apparatus laboratory T +82-31-8040-4401 E dtl@keri.re.kr

Smart grid apparatus laboratory T +82-31-8040-4402 E sgl@keri.re.kr | High power laboratory II T +82-31-420-6007 E hpl2@keri.re.kr

Switches (switchboards), circuit breakers, switches, transformers, insulators and bushing, transformers (CT/VT), smart grid equipment, protective relay (IED), watt-hour meter (AMI), surge protector, IEC61850 conformance (Level A), EMC, etc...

Certification/inspection business

Product certification service

Quality management department T +82-55-280-2403 E cert@keri.re.kr

Product certification refers to the documented assurance of the conformity of a product, process or service to the prescribed requirements by a third party. KERI has been accredited as a product certification body by ACCREDIA, an accreditation organization based in Italy, and the Korea Accreditation System (KAS) in accordance with the ISO/IEC 17065 (General requirements for product certification organization). This qualifies KERI to conduct product certification services for electric products and issue product certificates and marks.

ACCREDIA-accredited product certification body

As a third-party electrical product certification body accredited by ACCREDIA (Italian Accreditation System), we conduct conformity evaluation on electrical products and issue product certificates.

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
PRD N° 071B
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

KAS-accredited product certification body

KERI has established a certification scheme necessary to conduct product certification service including performance evaluation and follow-up management of domestic heavy electric equipment and was accredited as a third-party electrical product certification body by the Korea Accreditation System (KAS). We certify electrical products and issue product certificates and authorization for use of the product certification mark.

KAS-P-006

IECEE CB certification body

Product certification department T +82-31-8040-4404 E gad@keri.re.kr

As a national certification body (NCB) of the IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), KERI provides CE test certificates based on 64 standards in 5 categories: circuit breakers, switches, fuses, transformers and EMC.

Accredited inspection body

Product certification department T +82-31-8040-4404 E gad@keri.re.kr

KERI has been accredited by the Korea Laboratory Accreditation Scheme (KOLAS) as an accredited inspection body. Accordingly, KERI not only issues inspection reports but it also issues certificates of watt-hour meter type approval in accordance with the Measures Act.

Main testing and certification services

External cooperation and social contribution

SME support portal H https://bs.keri.re.kr

The SME(Small & Medium-sized Enterprise) support portal of KERI provides various supports for SMEs, including technology transfer, technical consulting, dispatch, support programs and equipment sharing.

Technology transfer T +82-55-280-1162 E ehkim@keri.re.kr

01 | Technology transfer

We aim to raise the rate of success of commercialization of technologies by spreading outcomes of KERI's R&D activities throughout the industries including companies that need them.

02 | Vision

Create the highest technology value in the nation. Establish open innovation system for technology commercialization.

03 | Technology transfer procedure

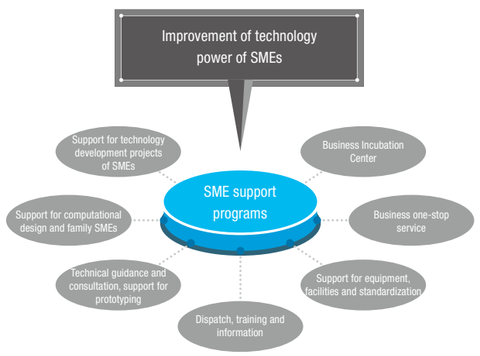
Search target technology | Submit application for technology transfer | Receive counseling about agreement terms | Sign licensing agreement | Follow-up management

SME support T +82-55-280-1123 E gyoh@keri.re.kr

KERI is making utmost effort to foster SMEs into becoming global star companies. We established Total Support System based Technical Demand Stage on SME's Life Cycle (TSSTDS), and support them to resolve their concerns about bottleneck technologies and R&D based on accumulated experience and knowledge of our researchers so that they can create remarkable outcomes.

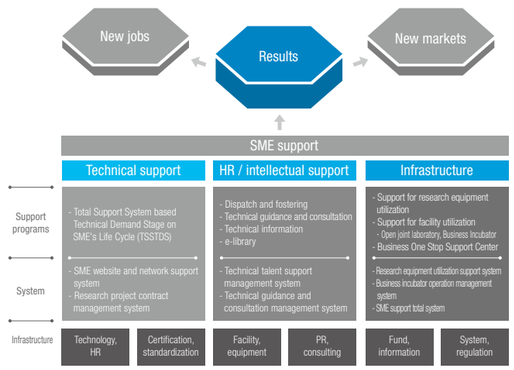
Support areas

Development and operation of R&D and non-R&D support programs to improve the technology power of SMEs and support infrastructure



Implementation system

Establishment and operation of KERI's superior infrastructure, support systems and support programs to help businesses to create results



Demand-based technology development support for SMEs

T +82-55-280-1123 E bwno@keri.re.kr

We strive to enhance the technology development capabilities of SMEs by providing R&D support to resolve bottleneck technology issues in workplaces and promoting the commercialization of transferred technologies.

Program type	Description
Bottleneck technology support program	Support for bottleneck technologies that SMEs experience in their production site.
Transferred technology support program	Support for transfer and commercialization of KERI's technologies for needs of SMEs
Commercialization connection technology support program	Support for promotion of commercialization and market entry of technology transferred from KERI to SMEs
R&D commercialization support program	Support for commercialization of technologies that can be commercialized directly from R&D

Technodoctor technical support

T +82-55-280-1670 E hgcho@keri.re.kr

To help SMEs resolve their bottleneck technologies to respond to demand, we provide our research resources in real time.

Program type	Description
Regular support	Immediate support for short-term problems (within 3 months) (Solution to bottleneck technology, technical consulting)
Multi-disciplinary support	Intensive support for complex problems through a multi-disciplinary approach (within 6 months) (including prototyping)
Fostering of family SMEs	One researcher provides one KERI family SME with technical guidance and consulting around the year.

Support for computational analysis-based product design

T +82-55-280-1568 E kimhk@keri.re.kr

We help SMEs improve their product development system by providing performance prediction and design validation of products based on computational analysis technology.

Program type	Description
Utilization of analysis technology	Improvement of product development capabilities through support for computational analysis technology-based design and technical consulting
Analysis technology training	Computational analysis technology transfer and training

Sharing of apparatuses and materials

T +82-55-280-1567 E ykchoi@keri.re.kr

To support technical innovation and infrastructure of SMEs, we provide support for the utilization of our expensive R&D equipment as well as equipment-based technical support.

Business Incubation Center

T +82-55-280-1081 E soyeon317@keri.re.kr

To contribute to creating jobs and vitalizing the local economy through support for prospective startups, we opened the Business Incubation Center in the field of electricity and information, and have actively helped establish startups.

Master's and Ph.D courses at University of Science & Technology (UST)

T +82-55-280-1262 E shpark2250@keri.re.kr

UST is the only national post-graduate research institute in Korea that was established to give educational function to government-funded research institutes in the field of science and technology and foster future leaders while vitalizing government-funded institutes. KERI runs a total of five major subjects, including nano-mechatronics, energy conversion engineering, electric functional material engineering, and power information and telecommunications engineering.

KERI tour guide

T +82-55-280-1153 E seo7539@keri.re.kr

KERI runs a tour program and an education donation program for group visitors, such as students from all levels and related experts as well as the general public.

- Acquired education donation institute certification mark (Ministry of Education)
- Awarded the Minister for Education award for excellent education donation institutes at the Korea Education Donation Awards 2013.

KERI's CSR activities

T +82-55-280-1213 E jsyun@keri.re.kr

KERI has continuously engaged in corporate social responsibility activities to fulfill our social responsibilities as a public institute and spread love among our neighbors.

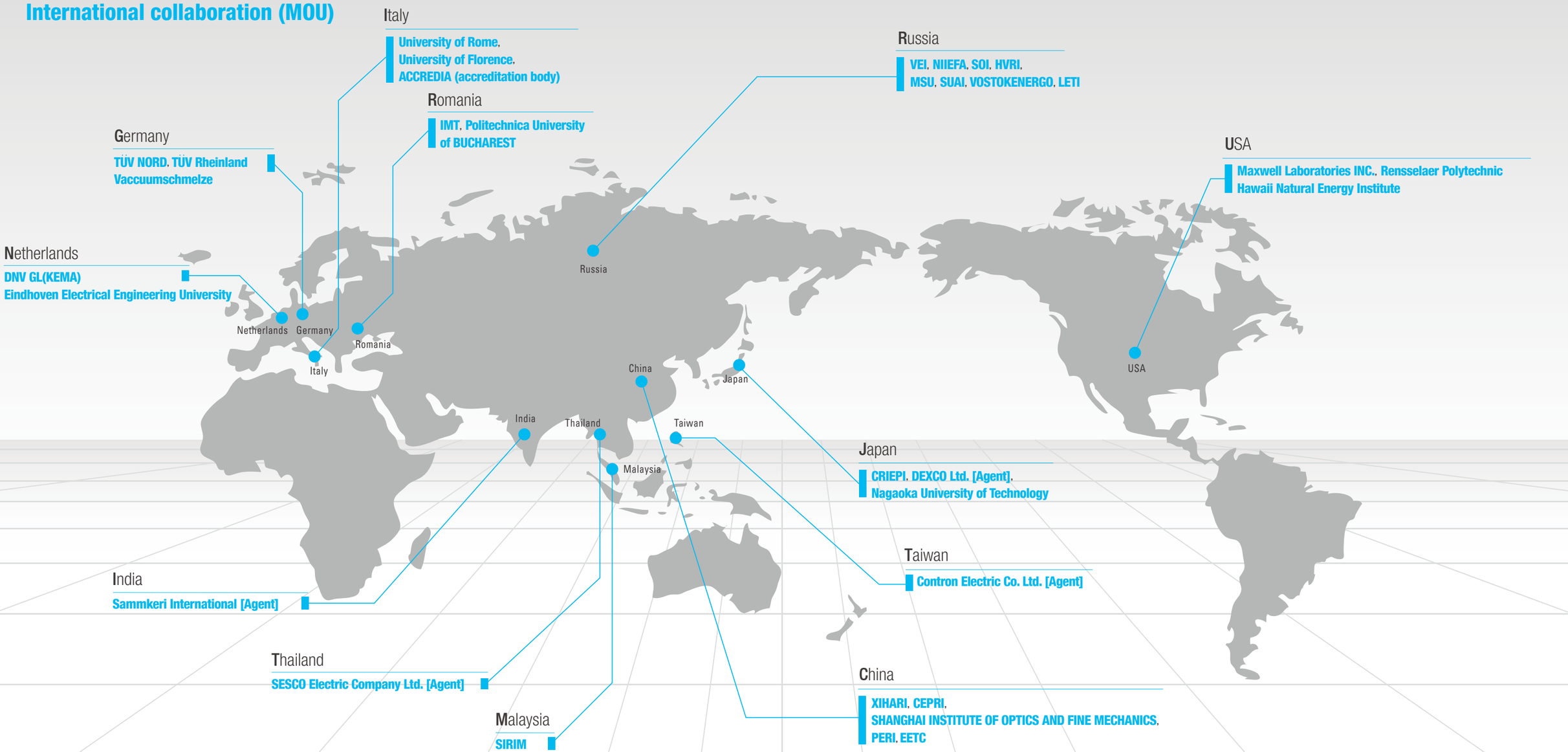
- Paycheck fraction-sharing campaign (KERI employees)
- KERI voluntary service club
- Blood donation campaign
- Donation of daily necessity for child breadwinners, senior citizens living alone and foster homes
- Science show inviting children from low income families and broken homes
- Various campaigns for electricity saving and environmental protection

KERI's open communication channels (Homepage & Social network)

Introduction of KERI's technology ambassador mascot [Kokoma KERI]

This character represents electricity as clean energy, the will of KERI members to contribute to popularizing scientific technology from a child's perspective, and our resolution to become the world's leading laboratory in the global era of technical competition.

International collaboration (MOU)



External Cooperation