Leading Technological Innovation of Energy.

Outline
Name: Central Research Institute of Electric Power Industry (CRIEPI)
President: Masanori Matsuura
Date of Establishment: November 7, 1951
About CRIEPI

CRIEPI is a central research and academic research institution for the electric power industry that supports the transformation of technology and systems pertaining to the supply and use of electric power and other forms of energy and leads technological innovation in the energy industry.
**RESEARCH FIELD**

**Nuclear Power Generation**
- Using light-water reactors on continued basis and supporting their stable operation
- Establishing nuclear fuel cycle technologies
- Supporting radioactive waste disposal operations
- Supporting decommission of nuclear power facilities
- Developing future technologies for light-water reactors and future nuclear reactor cycle technologies

**Thermal Power Generation**
- Streamlining maintenance and operation of thermal power plants
- Sophisticating operation of plants that accommodate increase in renewable energy
- Reducing CO₂ emissions in thermal energy field
- Addressing disaster risks at thermal power plants

**Hydropower Generation**
- Developing operation and maintenance technologies for hydropower facilities and addressing disaster risks at those facilities

**Renewable Energy**
- Supporting expanded introduction of low-carbon power sources
- Stabilizing power systems upon expanded introduction of renewable energy
**Electric Power Transmission and Distribution**

- Streamlining formation, operation and maintenance of electric power transmission and distribution facilities
- Supporting electric power system operation
- Addressing challenges that stem from growth in popularization of diverse consumer-side devices
- Addressing disaster risks with and cyber-attacks on electric power transmission and distribution facilities

**Customer Services**

- Promoting electrification and increasing customer satisfaction

**Environment**

- Addressing issue of global warming
- Streamlining assessment of environmental impact
- Addressing environmental and health risks such as PM2.5 and electromagnetic fields

**Utility Management**

- Evaluating consistency between electric power system reforms and energy policy

**Emerging Technologies**

- Performing overall optimization through coordinating supply and demand
- Surveying trends in technological development across entire electric power industry
- Conducting research aimed at application of IoT, AI and other innovative technologies in diverse fields
Research Network

With the aims of identifying trends in forefront energy-related R&D as well as strengthening and enhancing research networks, CRIEPI proactively engages in exchange with domestic and international partners possessing high technical standards.

International Partners for Research Cooperation Agreements

- French Alternative Energies and Atomic Energy Commission (CEA)
- Électricité de France (EDF)
- Studiecentrum voor Kernenergie • Centre d’Etude de l’Energie Nucléaire (SCK • CEN), BEL
- Korea Electric Power Corporation Research Institute (KEPRI)
- Korea Electrotechnology Research Institute (KERI)
- Korea Hydro & Nuclear Power Co., Ltd. Central Research Institute (KHN–CRI)
- China Electric Power Research Institute (CEPRI)
- Taiwan Power Company (TPC)
- Electric Power Research Institute (EPRI), USA
- Southwest Research Institute (SwRI), USA
- Organization for Economic Co-operation and Development / Nuclear Energy Agency (OECD/NEA)

etc.
Research History

- Establishment of CRIEPI (1951)
- Commencement of operation of Japan’s first commercial nuclear power plant (1966)
- Accidental at Chernobyl Nuclear Power Plant (1986)
- Oil crisis (1973, 1979)
- Accident at Three Mile Island Nuclear Generating Station (1979)

1950s > 1960s

- Developed high power transmission technology
- Streamlined designs for arched and gravity dams

1960s

- Promoted electrification of agricultural technology
- Developed prediction methods for diffusion of warm-water discharged from thermal and nuclear power plants

1970s

- Researched sophistication of lightning-protection designs for electric power facilities
- Conducted research aimed at modernization of power distribution systems
- Developed diffusion prediction method and environmental impact assessment method for stack gas from thermal power plants

1980s

- Researched transport, storage and disposal of radioactive waste
- Developed ultra high voltage (UHV) AC transmission technology
- Developed integrated coal gasification combined cycle (IGCC) power generation technology
- Conducted research on human factors

Model testing for spillway

- Analyzed and examined issues with electric power system operation
- Developed technologies for applying crude oil in thermal power generation

Warm-water diffusion testing

- Provided technological assistance for building nuclear power plants
- Developed “CRIEPI Short-Term Macro-Econometric Model”

Forced vibration test inside nuclear power plant building

- Developed precision evaluation methods of aseismic performance at nuclear power plants

UHV AC test transmission line

- Conducted research associated with electricity system reform for structural materials for nuclear reactors
- Researched materials for plant life management of nuclear reactors
- Researched life management for aging electric power facilities
- Conducted research aimed at improving safety and reducing risk in order to continue using nuclear power
- Conducted research on human factors

Coal gasifier

- Researched transport, storage and disposal of radioactive waste
- Developed ultra high voltage (UHV) AC transmission technology
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- Conducted research on human factors
1990s → 2000s

- Elevated precision of fault activity assessment methods to high levels
- Researched global warming projection and mitigation
- Studied biological effects of low-dose radiation
- Developed residential CO₂ heat pump water heater

2000s

- Sophisticated technology of analysis for stable operation of electric power systems
- Researched life management for aging electric power transmission and distribution facilities
- Researched materials for plant life management of nuclear reactors

2010s

- Conducted research aimed at improving safety and reducing risk in order to continue using nuclear power
- Conducted research associated with electricity system reform and energy policy
- Conducted research aimed at promoting electrification and improving customer satisfaction
● Establishment of CRIEPI

1960s

● Developed “CRIEPI Short-Term Model testing for spillway

● Provided technological assistance for warm-water diffusion testing

● Developed prediction methods for diffusion technology

● Promoted electrification of agricultural technology

1950s ▶ 1960s 1970s ▶ 1980s

(1951) Macro-Econometric Model”

● Commencement of nuclear power plant first commercial operation of Japan’s nuclear power plant

(1966)

● Accident at Three Mile Island Nuclear Power Plant (1979)

1970s 1950s 1990s 2010s

1980s

● Oil crisis (1973, 1979)

● Conducted research on human factors combined cycle (IGCC) power generation

● Developed integrated coal gasification technology

● Researched transport, storage and transmission technology

● Developed high power transmission technology

● Researched sophistication of plant building

● Developed ultra high voltage (UHV) AC transmission lines

● Advanced evaluation methods of aseismic systems

● Researched transport, storage and disposal of radioactive waste

● Conducted research on human factors for structural materials for nuclear reactors

● Conducted research associated with electricity system reform

● Conducted research aimed at improving customer satisfaction

● Conducted research aimed at improving safety and reducing risk in order to continue using nuclear power

● Conduction of research on environmental impact assessment method for CO2 concentration caused by doubling of surface temperature

● Researched global warming projection and mitigation

● Conducted research on human factors improvements in design of lightning-protection designs for electric power systems

● Researched transport, storage and disposal of radioactive waste

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1990s ▶ 2000s 2010s ▶

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2000s

● Major blackout across North America (2003)

● Major blackout in Hokkaido (2018)

2010s

● Adoption of Paris Agreement

● Accident at Fukushima Daiichi Generating Station (2011)

● JCO criticality accident (1999)

● Adoptions of KYOTO PROTOCOL (1997)