• The Kansai Electric Power Co., Inc. Annual Report 2002 Research and Development

Kansai EP carries out a keenly focused program of R&D targeting innovative breakthroughs to drive its future growth and contribute to a better world.





Hydrogen production and storage testing Technical Research Center)

Basic research into SOFC materials (Technical Research Center)

Redox-flow battery



Research into CO2 separation and fixation (Technical Research Center)

## Goals Set on Mutual Benefits

Kansai EP's aggressive stance on re search and development has two over riding objectives: to provide added convenience to our customers while contributing to environmental protec tion, and to forge a solid base for the Company's future operations. Here we introduce a sampling of some of our re cent initiatives and achievements in R&D.

# Technologies to Protect our Earthly Habitat

In conjunction with an array of initia tives all geared toward protection of the global environment, we are carrying for ward research into high-performance chemical absorbents of CO<sub>2</sub>. Our re search program has already yielded tan gible results that have obtained patents

# Engaging in a continuous pursuit of new technologies for tomorrow's products and services

not only in Japan but also in the United States, Europe and Asia, and our tech nology has been adopted in a urea pro duction plant in Malaysia. We are also engaged in research into technologies to regenerate tropical rain forests, in order to revitalize the natural environment and expand CO<sub>2</sub> absorption zones.

#### New Energy Storage Technology

Kansai EP is making rapid progress in the development of a new technology for storing energy, targeted at making a significant contribution to load leveling. The redox-flow battery is capable of storing electrical energy for subsequent retrieval as needed. It features a simple structure, light weight, small size and easy maintenance, and it is expected to be extremely effective as a power source for use in emergencies or for compensa tion against instantaneous voltage dips.

# Next-Generation Semiconductor Elements

The Company is conducting basic re search into silicon carbide (SiC) diodes, next-generation power semiconductor elements that are expected to enable substantial reductions in power loss. Our research is aimed at applying SiC diodes to the power industry. Unlike conventional silicon elements that cause more power losses and are easily broken under high voltages, SiC diodes are rev olutionary in their ability to curb power losses. They also offer outstanding ad vantages by enabling cooling devices of smaller size.

### High-Efficiency Fuel Cells

Solid oxide fuel cells (SOFC) are gar nering wide attention today as new power supplies offering excellent gener



ation efficiency, stability and environ mental friendliness. They are expected to be adopted as alternative power sup plies in applications ranging from smallscale home generators to large-scale power systems. At Kansai EP, we are en gaged in research into low-temperature SOFCs in a quest to realize cells of low cost, light weight and compact size.