7. Environment-Related Research and Development

Kyushu Electric Power implements Research and Development including effective use of industrial waste, prevention of global warming, and effective use of waste heat from power stations.

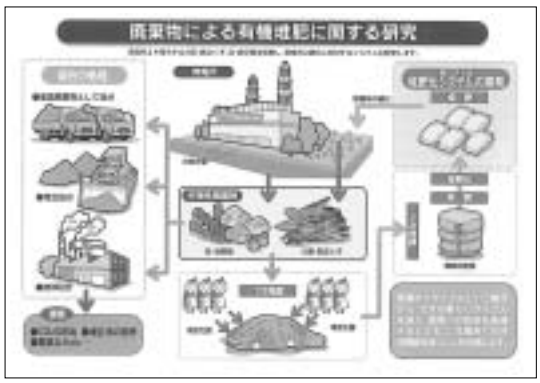
Research into effective use of coal ash

Kyushu Electric Power recycles coal ash generated during business operations mainly as a material for cement. Currently, research is underway for better and wider utilization such as for filling material and as a soil enhancer. New filling material has been developed in laboratory experiments, where cement and other substances are added to coal ash. The material will be put to a field demonstration test to confirm its strength and other properties.

Demonstration of the new filling material

Research into organic compost using waste

Kyushu Electric Power has been conducting research into the production of compost from power station waste such as shells, jellyfish, grass debris and other waste. Composting has been practiced on the waste from power stations by applying developed composting technology. We will test the effectiveness of the compost through plant cultivation in the future. Further testing is planned to determine if the developed technology may be applied to other power stations which produce different kinds of waste.



Development of chargers for mini electric vehicles

Electric vehicles are excellent for environmental conservation because they do not emit fumes during operation and are energy-efficient. There are high expectations for the widespread use of mini electric vehicles in the future, which can be easily charged from 100-volt electric outlets in homes. For this purpose, Kyushu Electric Power, together with three other electric power companies of Kansai, Tohoku and Hokuriku as well as PARK 24 Co.,Ltd and Japan Storage Battery Co., Ltd., have developed coin-operated charger stations and put them to a field test in rental parking spaces. Further improvements will be made based on the results to prepare them for practical use. Investigation is underway for their nationwide installation in the future.

Charger station for mini electric vehicles

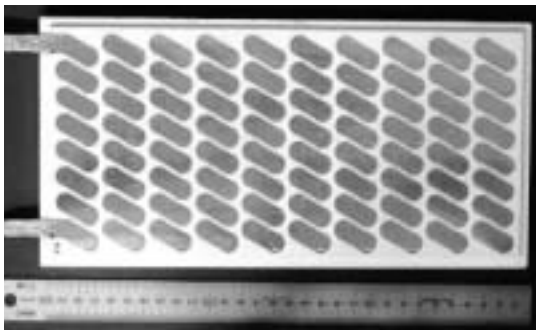
Research to evaluate *melia azedarah* trees' CO_2 fixation ability

Utilization of plants' CO_2 absorption ability is one of the measures against global warming, and *melia azedarah* is noted for its excellence in this regard. *Melia azedarah*, growing throughout Kyushu at an altitude of 600m or less, is a highly valuable tree for it can be used for construction and furniture-making, just as zelkova and paulownia trees. Through tissue culture, Kyushu Electric Power has produced a large number of *melia azedarah* saplings with high CO_2 absorption ability and good timber quality. They were planted on company land for research and evaluation of their CO_2 absorption ability.

Two years after planting grew to be 5 meters or taller.
(The cedar seedlings in front were planted at the same time.)

Research on power generation systems utilizing unused energy from power stations

Kyushu Electric Power is presently conducting Research and Development into heat recovery equipment that converts other forms of energy into thermal energy using thermoelectric conversion elements. It aims for efficiency improvement by exploiting unused energy from power stations such as waste heat. So far, a thorough demonstration test verified the large heat recovery module developed as being a stable system. Further research is planned for module efficiency improvements and cost reductions, as well as for the development of a heat recovery system that collects a large untapped heat source.



Heat recovery module

Development and practical application of Matsugoro - electric shock-type pine wilting prevention system

Kyushu Electric Power has developed Matsugoro, a system that uses electric shocks to prevent pine wilting from nematode (*Bursaphelenchus sp.*), which is considered to be the main cause of pine wilting and tree mortality. The system applies HV pulse currents to trees to suppress nematode reproduction. Some of the features of the system are:

- Very little impact on the natural environment or ecological system compared to conventional control methods using chemical agents
- Simple design does not spoil the beauty of pine trees
- Easy installation and removal due to compactness and light weight
- Time and energy savings since no complex maintenance is needed

Installed Matsugoro