

CURRENT AND PROSPECTIVE TECHNOLOGIES FOR CONSERVING AND RECYCLING ENERGY IN RELATION TO CONTROLLED ENVIRONMENT PLANT GROWTH FACILITIES IN JAPAN

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To solve issues such as shortages of food and energy and damage to the global environment, plants play an important role through providing materials for food, energy sources and environmental conservation. Therefore the demand for environmentally controlled growing facilities is increasing in fields as diverse as applied studies on genetic improvement of plants, production of huge numbers of high quality nursery plants, and fundamental studies on interactions between plants and environment. Users of such facilities hope to grow the plants at minimum energy input not only to reduce cost but also to prevent causing environmental problems themselves.

I will introduce the technological status and prospects for conserving and recycling energy in plant growth facilities in Japan. Improvement of structural thermal characteristics, operation of the heating and cooling systems and effective lighting systems are focused on as fundamental to energy saving in environmentally controlled facilities. I will also introduce several current facilities for growing plants such as plant factory systems, nursery plant production systems and closed plant production systems used for space research in Japan.