●Starting Stage

(Fiscal Year 2005-2007)

Kanto Plain Saitama Area

Establishment of Infrastructure for Achieving Environment Industry Cluster
Led by Safe and Secure " Resource Recycling Factory "

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Life Sciences
IT
Environment
Nanotech Materials
Others

Project Promotion

Director… ……Katsuhiko Shirai (President, HONJO WASEDA RESEARCH PARK FOUNDATION; President, Waseda University)

Research Advisors… ……Katsuya Nagata (Professor, Faculty of Science and Engineering, Waseda University; Institute Head, Waseda University Environmental Research Institute)

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Ryuichi Sudo (President, Center for Environmental Science in Saitama)

Science and Technology Coordinator… Sigeo Sasaki, Kazushige Watanabe

Core Research Organizations

Waseda University, Saitama University and others

Major Participating Research Organizations

Industry… 9 participating organizations for "Sainokuni Resource Recycling Factory" and other environment-related organizations

Academia…Waseda University, Saitama University and others

Government…Center for Environmental Science in Saitama, Saitama Prefectural Agriculture and Forestry Research Center

Aim of research and development

While quite a volume of waste products comes into Saitama Prefecture from other prefectures, the final disposal process greatly depends upon services outside the prefecture. The processing of the waste product is one of major issues of this prefecture that is the inland prefecture, and it is especially remarkable in this area. Therefore, in this area "Sainokuni Resource Recycling Factory" project to centralize the recycling industry to persist in safety and secure measures is promoted.

A base of industries, universities and the government in the area was established in the Waseda Research Park, that is located in proximity to the resource circulation factory for development and commercialization of the infrastructure technologies to improve various recycling technologies, safety and security.

As a result, it is promoted to have the recycling industry site in the resource circulation factories, the environment related companies are centralized for promotion of the infrastructure technologies in the area. This will eventually contribute to formation of an environmental industrial cluster as being a solution of regional issues and promotion measures of the industries.

Contents of research

[Research]

■Coordination and management of Research Exchange Forums and study meetings

The study meetings are held for exchange of information of industries, academia and government offices "Resource Circulation Forum". Study meetings and sessions will be arranged and managed to discuss specific issues per field or topic.

■Consignment Investigation (F/S: feasibility study)/Feasibility Test

Consignment investigations (for feasibility study F/S) are conducted for market assessment and feasibility of business as well as the feasibility tests for research and development of joint programs of industries, academia and government offices for practical use of products. This should be a base for the future joint research projects.

[Joint research activities]

As a model project of joint research programs, a research and development on bio-diesel fuels using waste biomass generated from metropolitan areas will be launched for its production, practical technologies, material selections for efficiency and safety and the environmental assessment as a joint program of Saitama University, Waseda University and other universities, institutions and companies for practical use of the technologies.

The main study results

1. Recycling technology of coffee waste and establishment of the utilization system

The development technology at the practical use level and the merchantability evaluation are established through the approach to the consignment investigation (feasibility study) by proposals and cooperation of the forum participating company group, mainly involved by Japan Beverage. It has already led to the business development by some participating companies. This new technology, regular coffee waste exhausted from the beverage, food, and a related proprietor and the vending machine is said to open the way for the recycling system with a coffee grounds by making it to the polymeric resin. This products gain attentions recently as being used for various eco-products (ballpoint and store articles, etc.).

Ball point pen prototype manufactured using molded resin with coffee lees

2. Development and evaluation of efficient recycling technology of municipal waste biomass and its safety

(1) Efficiency and improvement for separation and grading

● A model for improvement of separation, and the grinding technology with a particle size and a shape adjustment for a selective crushing technology and to prevent overgrinding including the surface grinding was established.

(2) Synthesizing of manufacturing and application technology of BDF

● The analysis method for free glycerin in BDF and the purification technique of the glycerin content waste fluid when BDF was manufactured were developed and established.

(3) Reforming technologies with carbonization and development of comprehensive utilization technology

● The optimum temperature condition of various organic wastes for the reduction and stabilization with the carbonization was clarified.

(4) Comprehensive environment and safety evaluation

● The sampling and monitoring techniques of particulate matters for the constituent determination for Nano particle (super-fine particle) collection generated in the fuel gas were established.