

## Study and Survey of Sewage Sludge Energization Technology Guidelines

Year of research

2010

Research of resource and energy in sustainability

### (Goals)

The goal of this project is to prepare guidelines using knowledge and information that regional governments need to study the introduction of sewage sludge energization technologies (solid fuelization technology, biogas usage technology, etc.), in order to support sewage system projects which contribute to the realization of a low-carbon society and to further promote global warming mitigation measures.

### (Results)

#### (1) Significance of the introduction of sewage sludge energization technologies

The study analyzed and organized the fact that the significance of introducing sewage sludge energization technologies (below referred to as “energization technologies”) are primarily “long-term and stable effective use of sewage sludge”, “improving operation through technologies utilizing energy value”, and “reducing greenhouse effect gases.”

#### (2) Organizing energization technology introduction cases

Information concerning cases of the introduction of energization technologies both in Japan and overseas was collected and organized.

#### (3) Study of the introduction of energization technologies

##### [1] Introduction study approach

To study the introduction of energization technologies, it is important to balance “challenges facing regional governments or characteristics of wastewater treatment plants”, “needs of those receiving products”, and “characteristics of energization technologies”, so points from each perspective were organized. The study procedure flow chart was obtained.

##### [2] Study of the form of the project

The contract form, legal system, and subsidy system etc. accompanying project implementation were organized.

##### [3] Organization of project evaluation methods

Energization technology cost information, greenhouse effect gas emission factors, and the approach to evaluations etc. were presented.

#### [4] Case studies

Cases studies of solid fuelization technologies (dewatered sludge treatment capacity: 30t/day, 90t/day) and biogas usage technologies (treated water quantity: 20,000 – 100,000 m<sup>3</sup>/day scale) were conducted. The following are the results of studies conducted with the case of an existing digestion tank, the case of a new digestion tank, and the case where biomass other than sewage sludge was accepted as the setting conditions. Greenhouse effect gas reduction effects were obtained by introducing energization technologies in all cases.

(Case where solid fuelization technologies are introduced)

- At 30t/day scale (equivalent to treated water of 30,000m<sup>3</sup>/day), the project cost was higher than that for landfill disposal, but accepting biomass other than sewage sludge obtained project profitability.
- At 90t/day scale (equivalent to treated water of 90,000m<sup>3</sup>/day), cost was cut between about 20% and 30% from the cost in the incineration disposal case.

(Case where biogas electric power generation technology was introduced)

- At treatment plants with existing digestion tanks, project profitability was obtained in every case.
- In the case where digestion tanks are newly installed, project profitability was obtained only at scale of 20,000m<sup>3</sup>/day scale. But, a positive income/expenditure balance was obtained by accepting biomass other than sewage sludge.

#### (4) Preparation of the guidelines

The above results have been summarized as Sewage Sludge Energization Technology Guidelines (Draft).

Work contracted from the Ministry of Land, Infrastructure, Transport and Tourism, City and Regional Development Bureau

Inquiries: Resource Recycling Research Division, Ishida Takashi, Urabe Mikio, Abe Mayumi

[03-5228-6541]

Key words

Energization technology, global warming countermeasures, solid fuel, biogas, thermolysis gas