

Study for the Utilization of Sewer Resources

Year of Research

2011 · 2012

Establishment of energy and resource recycling

(Purpose)

In recent years, global stringency of resources, energy supply and demand are concerned about and change to recycling society, construction of low-carbon society are required and it is demanded to switch from a conventional transient system that treats and removes sewage to a utilizing and recycling system as resources, energy for gathering materials.

This study researches utilization technologies of sewage sludge etc and evaluates the selection procedure of utilization technology of sewer resources according to the condition of each sewage treatment plant in order to diversify of the utilization menu about sewer resources and to promote stable utilization of sewer resources such as sewage sludge, from a standpoint of economical evaluation, energy supply and so on. In addition, we reconfirmed and arranged the issue of utilization of sewer resources according to the investigation results of actual acceptances of compound biomass.

(Results)

(1) Comparison between Annual Cost and Amount of Greenhouse Gas Emissions

Focusing the energy use of sewer resources, the flow of technology selection and calculation tools were developed to evaluate and select a suitable usage application for sewage plant of each cities. Based on the past R&D data of sludge fuelization investigation of Sludge Recycling Center in A city, the validity of the calculation tool was confirmed and the case study for the fuelization and digestion gas use was performed. The one of the calculated result was shown in Fig.1 and table1.

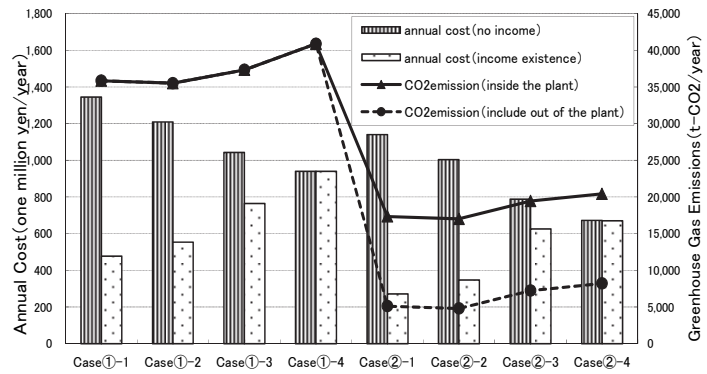


Fig.1 Comparison between Annual Cost and Greenhouse Gas Emissions according to the Case

Table 1 Case Setting About Energy Use

Treatment process of dewatered sludge	case	Digestion gas use	Digestion gas use quantity	Heating method of digestion tank
Incinerator (bubble fluidized bed incinerator)	①-1	Electric generation by gas	Electric generation : 100%	Heating by generation exhaust heat
	①-2	[Priority] Electric generation by gas > Incinerator fuel (rest)	Electric generation : 85% Incinerator fuel: 15%	Heating by generation exhaust heat (Amount of electric generation is based on the required of digestion tank heating.)
	①-3	[Priority] Incinerator fuel > Electric generation by gas (rest)	Electric generation : 38% Incinerator fuel: 62%	Heating by generation exhaust heat + Town gas (shortfall)
	①-4	Incinerator fuel priority, the rest is heating of digestion tank	Incinerator fuel: 62% Heating of digestion tank: 38%	Heating by digestion gas + Town gas (shortfall)
Low temperature carbonizing furnace	②-1	Electric generation by gas	Electric generation : 100%	Heating by generation exhaust heat
	②-2	[Priority] Electric generation by gas > Carbonizing furnace fuel (rest)	Electric generation : 85% Carbonizing furnace fuel: 15%	Heating by generation exhaust heat (Amount of electric generation is based on the required of digestion tank heating.)
	②-3	[Priority] Carbonizing furnace fuel > Electric generation by gas (rest)	Electric generation : 25% Carbonizing furnace fuel: 75%	Heating by generation exhaust heat + Town gas (shortfall)
	②-4	Carbonizing furnace fuel priority, the rest is heating of digestion tank	Carbonizing furnace fuel: 75% Heating of digestion tank: 25%	Heating by digestion gas + Town gas (shortfall)

(2) Application to other local governments

The study of introduction of facilities for digestion gas use and fuelization were performed for also other local governments by using similar tools. The study was performed by using the dewatered sludge processing technique with digestion gas use and the most suitable processing technique which corresponded to the every each local government requirement was able to propose and estimated.

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Key words

Sewer Resources, Utilization, Energy