

The Evaluation of Costs and Greenhouse Gas Reduction by Using Technologies for Energy from Sewage Sludge

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Abstract : Sewage sludge is a biomass resource that can create a solid fuel and electricity. Utilizing sewage sludge as a renewable energy can contribute to the reduction of greenhouse gasses. In Japan, 'The National Plan for the Promotion of Biomass Utilization' and 'The Priority Plan for Social Infrastructure Development' were approved at cabinet meetings in December 2010 and August 2012, respectively, to promote the energy utilization of sewage sludge. This study investigated costs and greenhouse gas emission in different sewage sludge treatments with technologies for energy from sewage sludge. Costs were estimated on capital costs and O&M costs including energy consumption of solid fuel plants and biogas power generation plants for sewage sludge. Results showed that cost of sludge digestion treatment with solid fuel technologies was 8% lower than landfill disposal. Greenhouse gas emission of sludge digestion treatment with solid fuel technologies was also 6,390t as CO₂ smaller than landfill disposal. Biogas power generation reduced the electricity of a wastewater treatment plant by 30% and the cost by 5%.

Keywords : global warming countermeasure, energy technology, solid fuel production, biogas

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