Demonstration of Power Generating Sludge Incineration for Greenhouse Gas Reduction (B-DASH)

(Research for FY 2017)

1. Purpose

"Power generating sludge incineration technology for greenhouse gas reduction" tries to majorly reduce power consumption at sludge incineration facilities and greenhouse gas emissions. This study aims to demonstrate the performance, the scope of application and the adoption effects of the technology using the actual scale experimental facilities set up for the project.

This research is adopted as B-DASH project[*1] 2017 of MLIT[*2]. The consortium of JFE Engineering Cooperation; Japan Sewage Works Agency (JS) and Kawasaki City conducts the demonstration as an entrusted research project of NILIM[*3].

*1.B-DASH Project: Breakthrough by Dynamic Approach in Sewage High Technology Project
*2.MLIT: Ministry of Land, Infrastructure, Transportation, and Tourism
*3.NILIM: National Institute for Land and Infrastructure Management

2.Overview of the demonstration technology

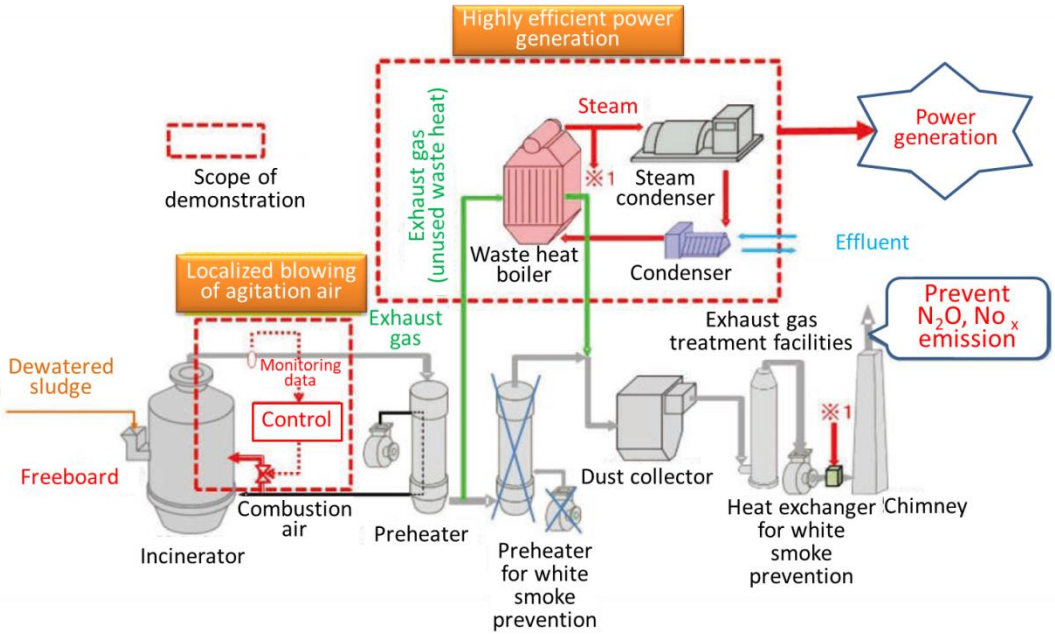

Figure1: Summary of demonstration

The technology is combined "Highly efficient power generation technology" with "Localized blowing of agitation air" (Figure 1.) "Highly efficient power generation technology" generates steam from unused waste heat inside a waste heat boiler and uses this steam for running a water-cooling steam condenser utilizing treated wastewater as cooling water to generate electric power highly efficiently. "Localized aeration technology" supplies combustion air from two parts of a furnace while an ordinary furnace supplies it only from its bottom. Additional localized combustion air from a freeboard area promotes the efficient sludge incineration and the reduction of N_2O and NO_x emission.

3.Achievements of this year

The demonstration facilities were set up at the existing three trains of incineration facilities with incineration amount of 40ds-t (150wet-t) per

day in Iriezaki sewage sludge center (Kawasaki City, Kanagawa Prefecture) to verify the performance of the technology.

The research results for this year were as follows:

(1) The steam condenser installed for the demonstration was verified that it had the specified power generation performance. The condenser was also confirmed it's applicability for the incineration facilities with a combustion capacity of 12.6 ds-t (60 wet-t) per day for dewatered sludge of water content rate of 79% or less.

(2) Highly efficient power generation technology was verified that its power generation capability was adaptable to the volume fluctuation of supplied dewatered sludge to an incinerator. Since the amount of steam flow was less than the first prospect this year, some improvements are required.

(3) It was verified that localized blowing of agitation air enabled the concurrent reduction of N_2O and NO_X emission.

4. Future issues

The demonstration continues next year to verify the performance of the technology. A case study is scheduled based on the demonstration data to confirm the LCC and the reduction effects of greenhouse gas emission and define the adoption effects of this technology.

Keywords: Reduction of electric power consumption, Reduction of greenhouse gas emission, Highly efficient power generation, Localized blowing of agitation air