

Increased total efficiency in sewage treatment

Project background

The Baltic States and other nations with a cold winter climate have problems meeting the requirements on treatment of nitrogen from sewage treatment plants set out in the Urban Wastewater Treatment Directive 98/15/EEC. The main reason for the observed difficulty is that the temperature of the sewage water during the winter season is typically below 10° C. This is too cold for the effective biological conversion of different nitrogen species to elemental nitrogen, N₂. Raising the temperature of sewage water entering treatment facilities will help many EU countries comply with legislation and reduce the threat of nitrogen-based pollution of European lakes and seas. To raise the temperature of the sewage water to about 20° C has so far been too costly. However, new information on heat exchange between untreated and treated sewage water has raised the possibility of a practical, environmentally-friendly and cost-effective solution.

Project objectives

The project aims to demonstrate an innovative technical solution for sewage treatment, based on heat exchange, which will significantly improve efficiency and effectiveness in regions with a cold winter climate. The project will design, purchase and set-up a pilot plant at Sjöstadsverket, Stockholm, based on heat exchange with untreated sewage waste - either from back flow to a combined heat and power plant or warm flue gases from sludge digesters. The design of the demonstration plant will be based on pre-studies carried out within the project and earlier tests of the Swedish Environmental Research Institute, IVL. To allow the biological system to stabilise, the demonstration phase is planned for one year, after which results will be evaluated. A control system will maintain water temperature at 19-20 °C throughout the process regardless of flow and temperature fluctuations at the inflow.

The process should ensure that the nitrogen concentration of wastewater will not exceed 10 mg/l during any season. This would reduce the outflow of nitrogen from Swedish sewage treatment plants by 35%. Electricity consumption for the blowers and mixers should also be reduced by 25-30% compared with traditional plants - only 50% of this saving will be used for additional pumping requirements. The process should be

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ITEST



Beneficiary:

Type of beneficiary

Local authority

Name of beneficiary

Municipality of Oskarshamn

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Duration of project:

36 months (01/01/2010 – 31/12/2012)

Total budget in euro:

1,226,800.00

EC contribution in euro with %:

613,400.00 (50.00%)

Generic Theme:

General: Waste management

easy to install and implement in both existing and new sewage treatment plants and should result in overall cost savings. Dissemination - especially to municipalities in the Baltic region - will start early through the Internet and with activities such as site visits, press releases and seminars.