



EffiSludge for LIFE - An innovative concept to improve resource and energy efficiency in treatment of Pulp and Paper industry effluents

LIFE14 CCM/SE/000221

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Project description:

Background

The pulp and paper industry in Europe and globally is a major user of electricity and emits large quantities of CO₂ (five per cent of the world's total industrial energy consumption in 2007, amounting to two per cent of direct CO₂ emissions from the industrial sector). The wastewater treatment within pulp and paper industry normally comprises a primary treatment for removal of suspended solids such as fibres and bark particles. Sedimentation, flotation and filtration techniques can be applied. The remaining wastewater needs to be cleaned to remove dissolved organic matter and an aerobic biological treatment is thus applied. Chemical oxygen demand (COD) is reduced by the action of active microorganisms, degrading the organic matter in the wastewater. Normally the biological treatment is run to obtain the lowest possible sludge yield, while obtaining a high COD-reduction. One of the reasons is that the sludge is seen as a waste that needs to be disposed of and not as a resource. The waste sludge within pulp and paper production is often dewatered and disposed of by incineration. Incineration of wet waste sludge has a negative energy balance and fuel needs to be supplied, which is a cost for the mills.

Objectives

The main aim of the EffiSludge for LIFE project is to build and operate the first ever demonstration plant that substantially increases the biogas potential from wastewater generated within the pulp and paper industry, and at the same time lowers electricity consumption by 50%.

The project will introduce an innovative process at pilot scale, by modifying the aerobic bio-treatment for increased production of waste sludge. The waste sludge from the bio-treatment will be used as a substrate for anaerobic digestion to biomethane, with sludge production being optimised for this purpose. The

final volume of residue sludge, after implementation of the EffiSludge concept, including anaerobic digestion, will be less than if the actions had not been implemented. In addition, biomethane will be produced from the organic matter in the wastewater.

Expected results: In comparison with the state-of-the-art within wastewater treatment at European pulp and paper mills, the EffiSludge for LIFE project is expected to give the following results:

- The electricity consumption in the aerobic wastewater treatment will be reduced by at least 50% per unit of wastewater;
- Biomethane corresponding to 0.10 – 0.15 m³/kg ingoing wastewater COD will be produced; and
- No negative effect on the quality of the outgoing wastewater should be observed, i.e. the levels of outgoing COD, N (nitrogen) and P (phosphorus) will be the same or lower than before the process change, and the final amount of residue sludge (after anaerobic digestion) will be less than that currently generated in the aerobic treatment; and
- The residue sludge generated from the EffiSludge process (after anaerobic digestion) will be less problematic to dewater than the waste sludge generated in the conventional bio-treatment, and higher dry matter content can thus be obtained before incineration.

Results

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Environmental issues addressed:

Themes

Climate change Mitigation - GHG reduction in EU ETS sectors

Climate change Mitigation - Renewable energies

Climate change Mitigation - Energy efficiency

Keywords

Biogas, use of waste as energy source, waste water treatment, energy saving, biofuel, energy efficiency, paper industry, renewable energy

Target EU Legislation

- Waste
- COM(2015)614 - "Closing the loop - An EU action plan for the Circular Economy" (02.12.2015)

- COM(2014)398 - "Towards a circular economy: a zero waste programme for Europe" (02.07.2014)
- Industry and Product Policy
- Directive 2008/1 - Integrated pollution prevention and control (15.01.2008)
- Climate Change & Energy efficiency
- Directive 2009/28 - Promotion of the use of energy from renewable sources (23.04.2009)
- Directive 2012/27 - Energy efficiency (25.10.2012)

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	Scandinavian Biogas Fuels AB
Type of organisation	Large enterprise
Description	Scandinavian Biogas is one of Sweden's largest private biogas producers. Its operations focus on industrial-level production and it has expertise in the design and operation of biogas plants to achieve consistently high levels of biogas. Its projects are managed in close cooperation with private and municipal stakeholders in the Nordic region, particularly in east and central Sweden. Scandinavian Biogas also produces biogas in South Korea.
Partners	None

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Administrative data:

Project reference	LIFE14 CCM/SE/000221
Duration	01-SEP-2015 to 31-DEC -2021
Total budget	5,791,809.00 €
EU contribution	1,863,958.00 €
Project location	Stockholm(Sverige) Östra Mellansverige(Sverige) Småland med Öarna(Sverige) Sydsverige(Sverige) Västsverige(Sverige) Norra Mellansverige(Sverige) Mellersta Norrland(Sverige) Övre Norrland(Sverige) Baltic Sea Sverige (S)(Sverige)

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