

Make way for recycling of cadmium contaminated biowaste as phosphorous fertilisation

Project: Full-scale site solution for phosphorous retrieval from biowaste, PhosCad
Project owner: IVL Swedish Environmental Research Institute Limited, Sweden
Duration: February 2012–July 2013
Year of BSAP funding: 2012
Approximate total budget: SEK 3 million
BSAP funding: EUR 175,000
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Through the co-financing agreement between the BSAP Fund and the foundation for IVL Swedish Environmental Research Institute (SIVL), IVL Swedish Environmental Research Institute Limited is able to perform steps necessary to minimise the occurrence of toxic substances in the recycling of phosphorus from biological waste.

The Baltic Sea suffers from eutrophication as a result of long-term heavy anthropogenic pressure, observed on the surface as excessive seaweed and algae production but also measured as oxygen depletion further down. In the southern parts of Sweden, seaweed and algae

accumulate in large amounts on the beaches. An interesting possibility is to make use of forceps and filamentous algae as renewable resources through biogas production and sludge production.

However, the completed cycle of using algae as a renewable source of phosphorous can be hindered due to a high content of cadmium. The challenge of phosphorous retrieval from biological waste material is both a result of the increasing demand of recycling phosphorous and more stringent regulations for cadmium content in sludge spread on arable land.

IVL aims at bridging the gap between research and industry and finds phosphorous retrieval from cadmium contaminated biowaste an issue of high priority. IVL will determine the most efficient way to handle the problem:

- Define the 2–3 most cost efficient methods to retrieve cadmium-free phosphorus from biowaste.
- Perform a cost-benefit analysis to develop and optimise processes.
- Develop laboratory capacity building and specific analytical methods.
- Perform a biological waste characterisation.
- Develop a business framework.

The challenge of retrieving phosphorous and removing cadmium from biowaste is also relevant for most municipal wastewater treatment plants. In Sweden, 212,000 tonnes of sludge was produced in 2009, of which less than one fourth was recycled for agricultural use.

This will be the first solution in Sweden for the recycling of phosphorous from cadmium-contaminated algae waste for agricultural use. It will be an important demonstration of a complete recycling of phosphorous concerning all communities with severe problems of algae waste on beaches as well as a demonstration for possibilities of complete recycling of phosphorous from cadmium contaminated wastewater sewage sludge in the Baltic Sea countries, which so far have been very limited.

IVL is currently engaged in several biogas related projects using biowaste from wastewater treatment plants, agriculture and the fishing industry. IVL is focusing on the different parts of the process: maximising the digestion process, retrieving clear water, identifying and removing contaminants. IVL, together with the Royal Institute of Technology, owns and runs the research and development facility Hammarby Sjöstadsverk, which is a platform for the development and exchange of knowledge and technologies in water treatment and related environmental technology.

Baltic Sea Action Plan Fund

The BSAP Fund is a fund managed by the Nordic Investment Bank (NIB) and the Nordic Environment Finance Corporation (NEFCO). The fund provides grants for technical assistance to projects that support the implementation of the HELCOM Baltic Sea Action Plan (BSAP). The aim of the BSAP is to help restore the ecological status of the Baltic Sea.

Recipients eligible for financing through the BSAP Fund include both public and private entities operating in the agricultural and wastewater treatment sectors, shipping and ports, as well as those working to reduce hazardous waste in the Baltic Sea catchment area. A key purpose of the fund is to facilitate and speed up the preparation of bankable projects. The fund provides grant financing for the following:

- Project preparation and development, including feasibility studies, development of business ideas, and cash-flow models
- Technical assistance for institutional support, that is, training and support needed for project preparation, development and implementation
- Measures that improve efficiency and quality in project implementation (e.g., the acquisition of equipment for demonstration purposes).

Sweden has committed SEK 90 million (EUR 9 million) to the BSAP Fund and Finland EUR 2 million.

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