



The use of biochar in order to reduce emissions from fur farms

The goals of the biochar project were both research-oriented and commercial. The project set out to find new solutions to the emission and odour problems of fur farming. The objective was to utilise the characteristics of biochar in finding business solutions to processing manure into a resource and reducing the environmental toll of fur farming. The commercial objective was to create an innovative network of businesses for developing the project results into a growing business.



Research work turned waste into a resource and a business idea

Fur farming is a central source of livelihood in the Kalajoki area. The continuity of fur farming is threatened by the greenhouse gas emissions and odour problems caused by the farms. Further challenges have emerged with the shutdown of the local composting plant, which has been important to the fur farmers. The project focused on developing a method for using biochar in processing manure to a commercially saleable organic fertiliser.

The aim of the project was to respond to challenges facing the fur farming industry by finding new solutions to emission and odour problems. Securing the continuity of the industry is vital for the regional economy, but new solutions must be sustainable. The biochar project achieved significant progress for creating sustainable growth and development for the industry by bringing fur farming into the circular economy. In addition to creating technical solutions, the project also developed a business network, which aims to create new market-ready products and innovations.

The manure of fur farms is a special waste, which has previously only caused expenses. The project developed a method, where a mixture of biochar and peat is mixed into the manure. The mixture becomes a raw material, which is processed into an organic fertiliser at a composting plant. The organic fertiliser can be used for the production of foodstuffs, because it has no harmful residues. Using fur farm animal manure as a fertiliser is also an efficient way of moving phosphorus from the Baltic Sea back into the food chain in the form of fish feed.

Developing special waste into a commercial product

Several studies were conducted at fur farms and the composting plant on the following topics:

- the optimal combination of the components for biochar-peat-manure mixtures
- usability of the mixture at fur farms
- the behaviour of the manure mixture in the processes of the composting plant

Biochar proved to be a good manure coverage substance, which reduced ammonia emissions at the farms. Adding biochar-peat mixture to fur manure reduced ammonia emissions by an average of 38 % and methane emissions by 34 % compared with plain manure compost. Biochar also slightly reduced the formation of carbon dioxide. In addition to reducing emissions, fur manure compost with biochar-peat mixture is well-suited for the cultivation of lettuce and basil. Biochar also improves the water retention capacity of compost, which reduces the need to irrigate the substrate.

Collaboration with businesses provides the basis for future growth

Another central goal was to form an innovation network between local businesses, which can use the project results for developing profitable business concepts and productising the compost mixture. The aim of the network is to attract national and international demand for the products being developed, e.g. substrates using biochar. As a result, a local business network was established in Kalajoki, which eventually turned into a growth-seeking business focused on manufacturing and marketing the substrate innovation created as a result of the project.



“The new company has already achieved several significant results. The organic fertiliser product has been given an organic certification by the Finnish Food Authority. The substrate product has also been delivered to markets. Development work is still ongoing and new products are expected to hit markets soon”, says Project Manager Maarit Hellsted from Natural Resources Institute Finland, describing the recently started business.

The project results are diverse: the biochar innovation advances carbon neutrality by reducing emissions, but also advances the local economy by improving the public image and sustainability of fur farming. At the same time, a new product has been developed for markets, which is generating new business.

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Project code: **A71070**

**Natural Resources Institute Finland,
Kalajoki Business Service Centre**

1.8.2015–30.6.2018

Budget: **800 500 €**

ERDF funding from the Council of Oulu
Region: **560 350 €**

Objectives

- Using biochar to find business solutions for turning fur farm manure into a resource and reducing the environmental toll of fur farms.
- Creating a network innovation, which would improve the environment for business and product development, create new business opportunities and provide significant emission reductions.
- Supporting the local economy by securing the operation of fur farms and creating new employment opportunities in the industry.
- Developing a carbon neutral composting method, which permanently sequesters carbon to the soil.

Results

- New knowledge about the advantages of using biochar in fur farms and manure composting. Odour issues and emissions of ammonia and methane were reduced.
- A co-creation operation model was created, where productisation and marketing were studied simultaneously with research activities. As a result of the model, the revenue generation logic, a working product model and a sales and marketing concept were ready by the end of the project.
- A new business was started for the manufacturing and marketing of the organic fertiliser developed in the project.
- The fur farming industry gained positive publicity and improved its public image.

Oulu Regional Council allocates funding for regional development from the ERDF

Oulu Regional Council is a Managing Authority for the Sustainable growth and jobs 2014–2020 – Finland’s Structural Funds Programme in Northern Ostrobothnia.

European Regional Development Fund’s (ERDF) main objectives are to improve the competitiveness of SMEs and produce and use the latest information and knowledge.

‘Sustainable growth and jobs 2014–2020 – Finland’s structural funds programme’ has two priority axes and seven specific objectives for ERDF. Each project must deliver at least one of these specific objectives.

ERDF priority axes and specific objectives:

1. Competitiveness of SMEs
 - Generating new business
 - Improving transport and logistic connections that are important to SMEs (Eastern and Northern Finland)
 - Promoting growth and internationalisation of enterprises
 - Promoting energy efficiency in SMEs
2. Producing and using the latest information and knowledge
 - Development of the centres of research, expertise and innovation on the basis of regional strengths
 - Strengthening innovation in enterprises
 - Developing solutions based on renewable energy and energy-efficient solutions

More information on Structural Funds in Finland from the dedicated website www.rakennerahastot.fi