



# BIOMAL



Karlskoga Combined Heat and Power plant in Sweden, one of the plants where Biomal fuel is used. Biomal is co-combusted with peat and waste wood in two circulating fluidised bed boilers.

Environmentally favourable  
Financially advantageous  
Energy effective  
Safe  
Concept  
for handling  
Animal by-products

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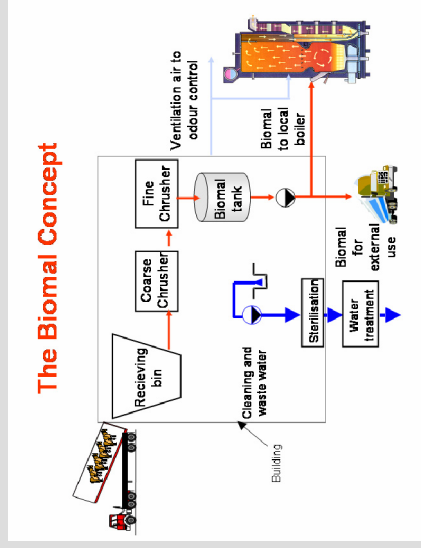


**[www.biomal.com](http://www.biomal.com)**

## The invention

The conventional way of handling animal by-products is to crush, sterilise, dry and pulverise it after separation of the animal fat. The separated fat can be combusted in regular oil burners and are today used in for example heat and power plants as a substitute for oil. The meat and bone meal (MBM) is widely used in Europe for energy generation, cement manufacture and the produced ash for road building. Processing the raw material into fat and MBM is very energy consuming and unnecessary complicated and expensive since the animal waste any how have to be incinerated.

An easier, cheaper, more energy effective and environmentally favourable concept was hence developed by the companies **Konvex** and **S.E.P. Scandinavian Energy Project** in Sweden. The concept is called the Bioma|™ concept and the fuel produced is called Bioma|.



The Bioma| concept is less complicated while the energy demanding processing of the raw material into fat and MBM is removed. The raw material is just crushed and grinded and then pumped to a fluidised bed boiler where it is co-combusted together with a base fuel such as wood chips, peat or municipal waste. Energy is recovered from the animal by-products by producing renewable heat and electricity and the net outcome of energy is considerably increased.

## Environmental advantages

- The risk for BSE-infection or other diseases is eliminated.
- The Bioma| concept is an energy effective method compared to the more complicated conventional method.
- The risk for smell is reduced while the stages where the material is heated up is removed.
- The water usage and the discharge of biological oxygen demanding substances are reduced.

## Combustion of Bioma| in commercial boiler

Bioma| has been used as a commercial fuel for three firing seasons together with peat and waste wood in the two 40 MW CFB boilers at Karlskoga CHP plant. The proportion of Bioma| in the boiler has been about 20 energy percent. A permanent plant for receiving Bioma| has been built.

Experiences from the combustion shows that co-combustion with Bioma| gives:

- approximately the same energy output per tonne material as wood chips
- a stable and good combustion with low emissions of CO, TOC (total organic carbon) and PAH (polyaromatic hydrocarbons)
- decreased emissions of nitrogen oxides



Bioma| burner connected to the boiler.



Bioma| is delivered with a bulk vehicle and is pumped to the receiving station.

## The LIFE project

16 million tonnes of animal by-products are produced annually in Europe. The costs for rendering and destroying this raw material exceed one billion euros. It is of great importance for Europe to find new ways of taking care of these products in a good way. The aim of this project is to demonstrate the environmental advantages of Bioma| in a full scale application. The LIFE Committee in the European Union will fund the project with a bit over one million euros.

A new, modern, grinding plant for production of Bioma| fuel will be built in Karlskoga with a yearly capacity of 85 000 tonnes. The plant will mainly take care of carcasses, but also some by-products from slaughterhouses. Several combustions tests at the Karlskoga CHP plant will be carried out in the project and the environmental aspects of the combustion will be evaluated. Another main task in the project is to technically evaluate this new concept and to inform other countries in Europe about its advantages.

