

# Biogas Kristianstad



Kristianstad is the capitol of Region Skåne in Sweden and the nucleus of the north east of Skåne. About 79.000 people live in the municipal area. The Kristianstad Region has some of the best agricultural land in Europe. Good farming conditions, a high level of mechanisation, a good environment and specialised investment in research and development have made Kristianstad into one of the major food centres of Sweden.



*Upgrading plant GR2*

## Production

Biogas is produced at three different locations in Kristianstad.

- The Landfill
- The Waste water treatment plant
- The Biogas plant in Karpalund

The landfill gas (about 15 000 MWh) is used for incineration in the district heating plant, together with a part of the biogas from the plant in Karpalund.

The biogas from the wastewater treatment plant is used partly for internal heating production (4 000 MWh) and partly 3 000 MWh) as vehicle fuel.

## Biogas plant Karpalund

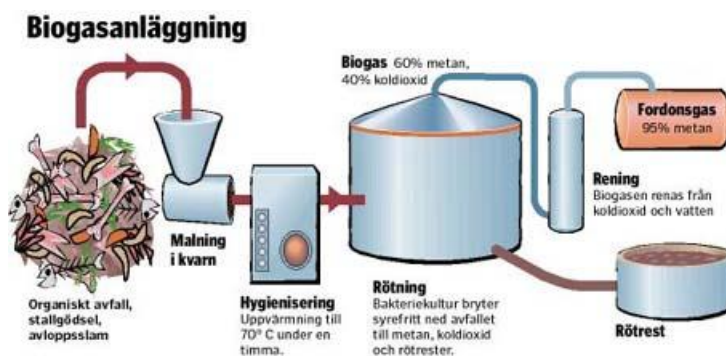
In 1997 the local Municipal Waste Management Company (*Kristianstads Renhållnings AB*) established the biogas plant in Kristianstad, primarily as a treatment plant for waste from the food industry in Kristianstad. The Karpalund plant is the first in Sweden to co-digest municipal solid waste from households (sorted into paper bags) and food industry together with manure for production of useful energy and fertiliser. The project is a result of co-operation between the municipality, farmers, industry and consumers. The production at Karpalund is approx. 40 000 MWh on a yearly basis.

From 1999 half of the biogas production at the Waste Water Treatment Plant is upgraded and used as fuel for busses.



## The digestion process

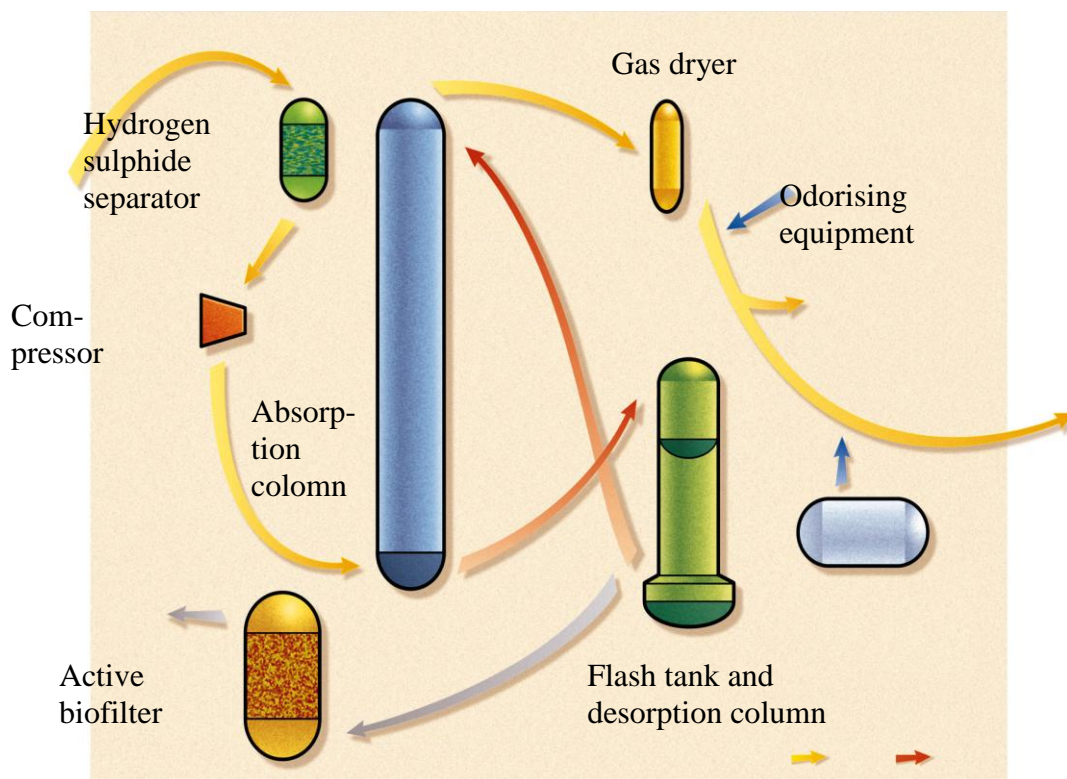
Digestion is defined as the biological decomposition of organic matter of biological origin under anaerobic conditions with an accompanying production primarily of methane ( $\text{CH}_4$ ) and carbon dioxide ( $\text{CO}_2$ ). In biogas the methane content is approximately 65 % to 70 % by volume. Before you can use it as fuel for vehicles you must eliminate most of the carbon dioxide by upgrading.



Biogas plant, principle

## Plant for upgrading gas

Through absorption with water under pressure (approx 10 bar), the carbon dioxide will decrease and the methane will increase to a purity of approximately 97 % by volume. The process unit consists mainly of gas compressors followed by a cooler, an absorption tower filled with small plastic bearings to increase the contact surface between fluid and gas. Wastewater from outlet of the waste water treatment plant is entered in the top of the absorption tower, and is pouring down via the plastic bearings in opposite direction versus the gas. The water is thereafter led to the degassing tower to air the gas from the fluid to reduce the loss of methane and recycle the gas. Finally the gas dries in an adsorption dryer to finish the production gas. The capacity of the plant is 200 Nm<sup>3</sup>/h upgrading gas. The two upgrading plants in Kristianstad have a combined capacity of approx. 50 000 MWh/year. See *upgrading plant, principle*:



## Utilization of biogas as vehicle fuel

Produced biogas is presently used both for heating (65 %) and as fuel for busses and other vehicles (35 %) One of the goals of the project is to increase the use of biogas in the transport sector. Total potential 2009 is 44 MWh biogas which can replace 4,4 million litres of petrol/diesel.

The Public transport Company, Skånetrafiken, has introduced biogas in the city-transportation. 24 buses are presently in operation. The municipality has established a car pool with biogas cars and private companies and households use biogas vehicles. The total number of vehicles running on biogas in Kristianstad is about 250, March 2009.

The municipality is marketing biogas as fuel on the local market. This project aims to increase the number of vehicles fuelled by biogas. This is a joint venture with the private company E.ON as well as local car dealers.

Kristianstad has been awarded several times during the past years:

- Campaign for Take Off Award (2001)
- Climate Star (2002)
- Energy Globe Award 3<sup>rd</sup> prize (2003)
- Best Climate Work in Swedish Municipalities (The Swedish Association for Nature Conservation) 2005
- Best work for environmental friendly cars (The Swedish association of Green Motorists) 2008



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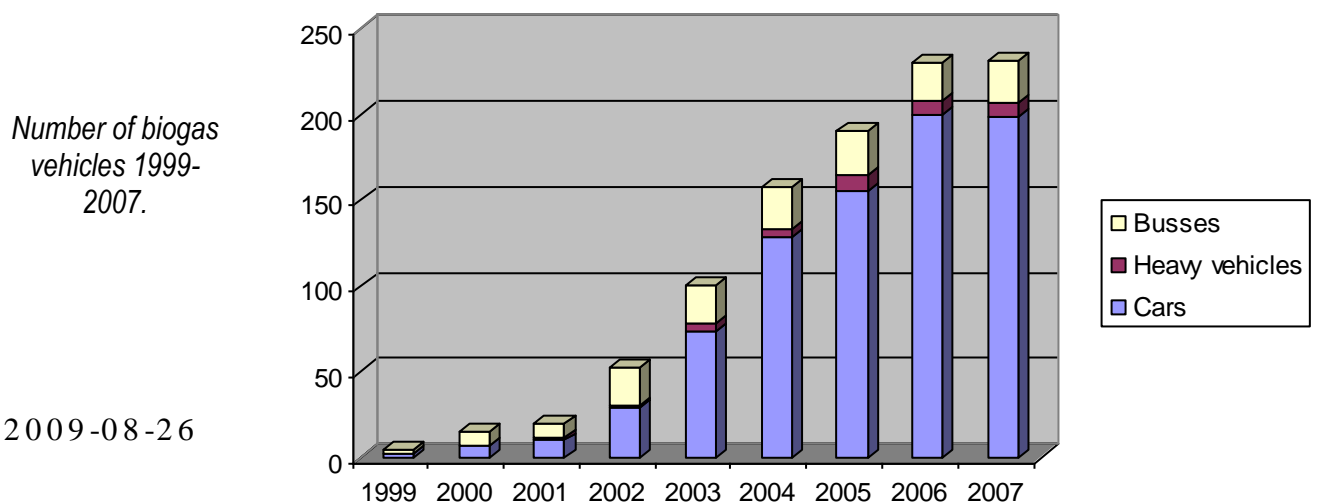
Kommunledningskontoret

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Number of biogas vehicles



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