

# Waste incineration - and energy recovery

Waste incineration plants are important suppliers of heat and electricity in Danish energy supply.

In Denmark, waste is not merely an environmental problem. Non-recyclable waste must be disposed of in an environmentally friendly manner. Danish waste incineration plants exploit the energy from waste, and the majority of plants produce both heat and electricity. Thus waste incineration plants are important suppliers of heat and electricity in Danish energy supply.

## No more landfilling of waste suitable for incineration

From 1 January 1997 Denmark stopped landfilling waste suitable for incineration. This led to an extensive increase in the incineration capacity at the end of the 1990s and in early 2000. Since 2001 Denmark has largely balanced incineration capacity and waste volumes. This means that all waste suitable for incineration is being incinerated at waste incineration plants where energy production is exploited. Since waste generation varies, limited waste volumes may however be temporarily landfilled for later incineration.

## 3.7 million tonnes of waste in one year

In 2007 about 3.7 million tonnes of waste was incinerated at a total of 29 waste incineration plants in Denmark. The incineration capacity of the plants varies between 12,000 tonnes og 520,000 tonnes of waste each year.



Figure 1: Location of waste incineration plants in Denmark





**Waste incineration plants as energy producers**

Danish waste incineration plants are characterised by a very high energy recovery rate. Electricity can almost always be supplied to the public electricity grid. An important prerequisite for plants to be energy efficient is that the heat generated can be supplied to a district heating network.

The aim is to ensure maximum energy recovery and to dispose of as much waste as possible in combined heat and power plants where the energy content of waste is converted into both electricity and heat. Out of the total volume of waste for incineration, 84% was burned at combined heat and power plants and 16% at plants only generating heat.

**Contributed 38 million GJ for energy supply**

In 2007 waste contributed about 38 million GJ for energy supply in Denmark. In 2007 about 20% of total Danish district heating production was generated on the basis of waste and about 4.5% of electricity generation was based on waste. Overall about 67% of energy content in waste in Denmark was converted into district heating while 15% was converted into electricity.

**Energy production as financial prerequisite for less expensive waste incineration**

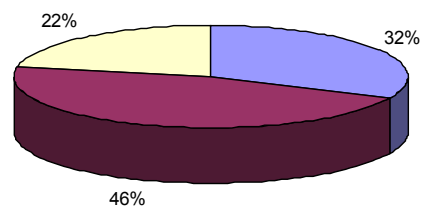
Usually it costs money to burn waste. Therefore waste producers pay an incineration fee when waste is delivered to an incineration plant. Incineration plants provide three services, i.e. waste disposal, and production of heat and electricity.

When electricity and heat are sold, revenues can be spent on reducing the incineration fee. Selling energy is important to the economy of the plants - see the figure on the right.

On average, revenues from selling heat cover nearly 70% of a plant's total costs. This means that the incineration fee only has to cover about 30% of the costs, and therefore Danish waste incineration plants have some of the lowest incineration prices in Europe.



Average dispersion of revenue from waste incineration



- Waste incineration fee
- Revenue from sale of heat
- Revenue from sale of electricity