

Waste-to-Energy power plant in the Municipality of Kotka (Finland)

Keywords	Waste management, Waste-to-Energy (WtE), Combined Heat and Power Production (CHP)			
Main photos	 			
Objectives of the action	<p>As in the case of other Finnish cities, the municipality of Kotka requires a lot of energy to heat its households and other buildings in the district heating system. Apart from environmental concerns, development of renewable energy sources is meant to make up for the absence of oil, coal and natural gas. Korkeakoski Plant in Kotka is Finland's first municipal waste-to-energy power plant and positions Kotka as a leader in waste management. The construction helps to achieve such goals as:</p> <ul style="list-style-type: none"> ➤ Satisfying the industry's demand of process steam and power ➤ Increasing the use of renewable energy sources within the territory ➤ Taking use of unrecyclable waste and meeting the requirements of EU's Landfill Directive 			
Description of the action	<p>The construction of Kotka's new waste incineration plant started in August 2006. After two years the test runs have been made and the plant has been running on commercial basis since April 2009. The total construction cost reached €60 million and main actors involved in the project are Kotka Energy Ltd (the company which is 100% owned by the City of Kotka), regional waste service companies and Sonoco cardboard mill located next to the WtE-plant.</p> <ul style="list-style-type: none"> ➤ Main fuel for the plant is domestic pre-sorted waste (all recyclable waste, like bio waste, glass, metal and hazardous waste should be removed beforehand); the plant produces electricity, process steam and district heat ➤ Annual operating time is over 11 months and the plant operates always in 100% output ➤ Annual usage of waste is 90,000 tonnes, which provides the energy of about 260,000 MWh; daily usage is 300 tons ➤ Waste is collected from four surrounding areas with the total population of 540,000 ➤ Operating lifetime of the plant is estimated as more than 20 years ➤ Decontamination of combustion gas is assured by the complete flue gas cleaning system, able to meet all criteria included in EU's new waste incineration Directive <p><u>Other technical information:</u></p> <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top;"> Boiler: Fuel capacity: 34 MW Steam pressure: 40 bar Steam temperature: 400°C </td> <td style="vertical-align: top;"> Turbine: Max. electrical power: 8.5 MW Condenser </td> <td style="vertical-align: top;"> Typical operational outputs: Electrical power: 5 MW Steam power: 15 MW District heat power: 8 MW </td> </tr> </table> <p>Korkeakoski WtE Plant is the most recent of all projects implemented by the Municipality of Kotka, which aim is to take use of combined heat and power production using renewable energy sources in co-operation with local industry. Other projects include the modernisation of Hovinsaari power plant, previously running on coal, which is now using various bio and recycling fuels and natural gas, as well as the construction of two wind power facilities with 1MW capacity.</p>	Boiler: Fuel capacity: 34 MW Steam pressure: 40 bar Steam temperature: 400°C	Turbine: Max. electrical power: 8.5 MW Condenser	Typical operational outputs: Electrical power: 5 MW Steam power: 15 MW District heat power: 8 MW
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Results / Achievements	<p>The plant allows the Municipality of Kotka to reduce the annual CO₂ emissions by 80,000 tons, which makes for 20% of annual reductions (390,000 tons of CO₂). It also strengthens the role of district heating – a highly efficient form of power generation. The total market share of district heating in Kotka is now 55% and the share of renewables in the energy production is 38%.</p>			
Friendly advice for replication	<p>Do not underestimate the investment costs, ensure the supply of waste and the sale of produced energy with long term agreements, carry out the economic analysis in order to ensure the profitability of the investment, communicate all environmental effects to the public openly.</p>			
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