

# CHP in Sofiyska Voda

At the beginning of 2008, Sofiyska Voda AD, started the selection process of a company for the delivery, installation and commissioning of a co-generator to utilize biogas from Kubratovo Wastewater Treatment works.

This £2.3 million project included the installation of three Combined Heat and Power (CHP) engines to allow the full use of the biogas produced in the decomposition of sewage sludge turning it into heat and electricity. The engines have been assembled in anti-vibration frames and will be fed biogas through a pipeline. This pipeline is connected to one of three activated carbon absorbers, which will treat the gas before it enters the CHP engines. The burned off gases are fed into a gas turbine thickener and collector, where they are distributed into the atmosphere through a chimney.

Both the heat and the electricity are captured by the works, with the full capacity of each CHP engine producing 1063kW of electric power and 1088kW of heat energy. 100% of the sewage sludge produced at the works now receives anaerobic digestion, with all of the biogas produced during this process utilised by the CHP engines.

Initially, between 60% and 70% of the treatment works' electricity consumption needs were to be met by the electricity generated from the CHP engines. The remaining electricity generated by this process would be sold to the national electricity company. Selling electricity generated by this process enables the works to purchase electricity from the national electricity company at a reduced rate of 50%. However, a requirement of this reduced rate insists on the production of a schedule for hourly electricity consumption of the wastewater treatment works produced on a weekly basis. Due to the unpredictability of the production of biogas because of the biological treatment processes employed, it was considered too challenging to precisely forecast biogas production. Therefore Sofiyska Voda AD are in final negotiations with the national electricity company to sell all of the CHP electricity generated at the Kubratovo Wastewater Treatment Works at a higher price than electricity generated by fossil fuels.

The water, heated in the heat exchangers to temperatures up to 80°C, is passed through a water distributor from where it is fed into the existing heating system which is used to heat the digesters and all buildings on the works. 100% of the heat produced by the CHP process is used in this way.