

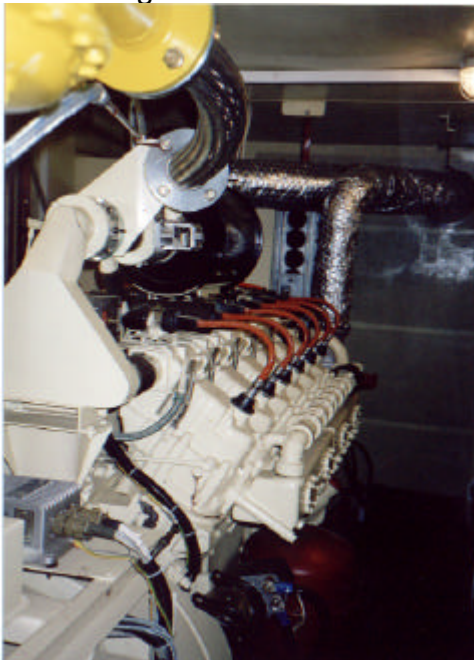
## PROSMACO - Promotion of Small Scale Cogeneration

### Case Study One/pl: Sewage Treatment Plant in Sokolow Podlaski (Poland)

Around 100 km to the east of Warsaw, in a typical agricultural area where intensive cattle rising farms and meat industry plants are located, a city of 18 000 build its first sewage treatment plant in the 70's. At the beginning the sewage clarification plant had only a mechanical stage situated upstream. Just 5 years later a biological stage was added. The plant developed over the years as new needs were arising from developing city and meat processing factories that were build there. Consequently now the plant is conceived for a population equivalence of 100 000.

#### The principle

During technological processes of sewage treatment the dried



The 12 cylinder engine  
Photo: J. Schnotale

sludge is subsequently fed into digestion tank, where aerobic fermentation process sets free biogas, which then can be used as a fuel to produce thermal energy to heat the mass of sewage sludge up to 32 - 34 °C, hence adding the production of biogas in the digestion tank. Until beginning of the year 2000 the extensive plant technology was supplied with electricity form the mains.



The heat recovery block  
Photo: W Wdowinski

The development of the concept of environmental protection and cost saving technologies acted now to push the installation of a CHP unit that now provides the plan with autonomously generated electricity. The heat resulting from the CHP unit is used for process technology and heating buildings.

The prime mover used in the CHP unit is an 12 cylinder engine that was adopted by PZL WOLA, Warsaw, Poland. The heat recovery module was supplied by GAZTERM, Warsaw, Poland. The design and whole installation of the unit was commissioned by sewage treatment plant operator Przedsię biorstwo Usług Inzynieryjnych I Komunalnych Ltd (PUIK), Sokolow Podlaski, Poland. A fairly complicate solution for the design of new

power house was used, the interior of which expressively reflects the goal of "high-tech" for and in harmony with the environment.

**The quality and environmental impact of work done by PUIK management was rewarded by European Organization for Quality, Deutsche Gesellschaft für Qualität E.V. and Polish Center for Investigation and Certification by nominating in 2000 the PUIK with a prestigious reward of "MISTER POLAND".**

### **Technical characteristics**

Installed electrical capacity: 200 kWe

Prime mover : 12 Cylinders engine

Electrical efficiency : 30%

Thermal efficiency: 60%

Overall efficiency: 90%

Avoided CO2 emission: 2 700 Tons CO2/year

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