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## **Advanced plant upgrades using modern technology and design tools**

***Increasing the combustion capacity and the performance of existing waste to energy plants***

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### **Abstract**

The amount of municipal solid waste is still increasing and the calorific value of the waste is steadily growing. The combined result is an increasing demand for new thermal treatment capacities. An alternative solution to new waste-to-energy projects is an expansion and technical upgrade of existing incineration plants. This is an advantageous option for waste management companies because they avoid the NIMBY syndrome and the difficulties in getting permits for green field projects. Furthermore, the investment cost per tonne burned waste is less than that for a new incineration line.

This paper will present the basic ideas and principles used in upgraded projects. The core of the technology is a combination of a new furnace design, new water cooled wear zones and combustion grates and new control systems. Moreover, CFD modelling is an important tool in the design phase, and the paper gives a demonstration of the flow design process applied at Babcock & Wilcox Vølund. CFD gives the designer the possibility of checking the design for a large number of critical factors such as velocities, mixing of combustion products and secondary air, oxygen and CO concentration, temperature, surface temperature, corrosion etc. This ability is extremely valuable in the case of expansion of existing incineration plants because many of the process parameters have to be within the limits of the old plant.