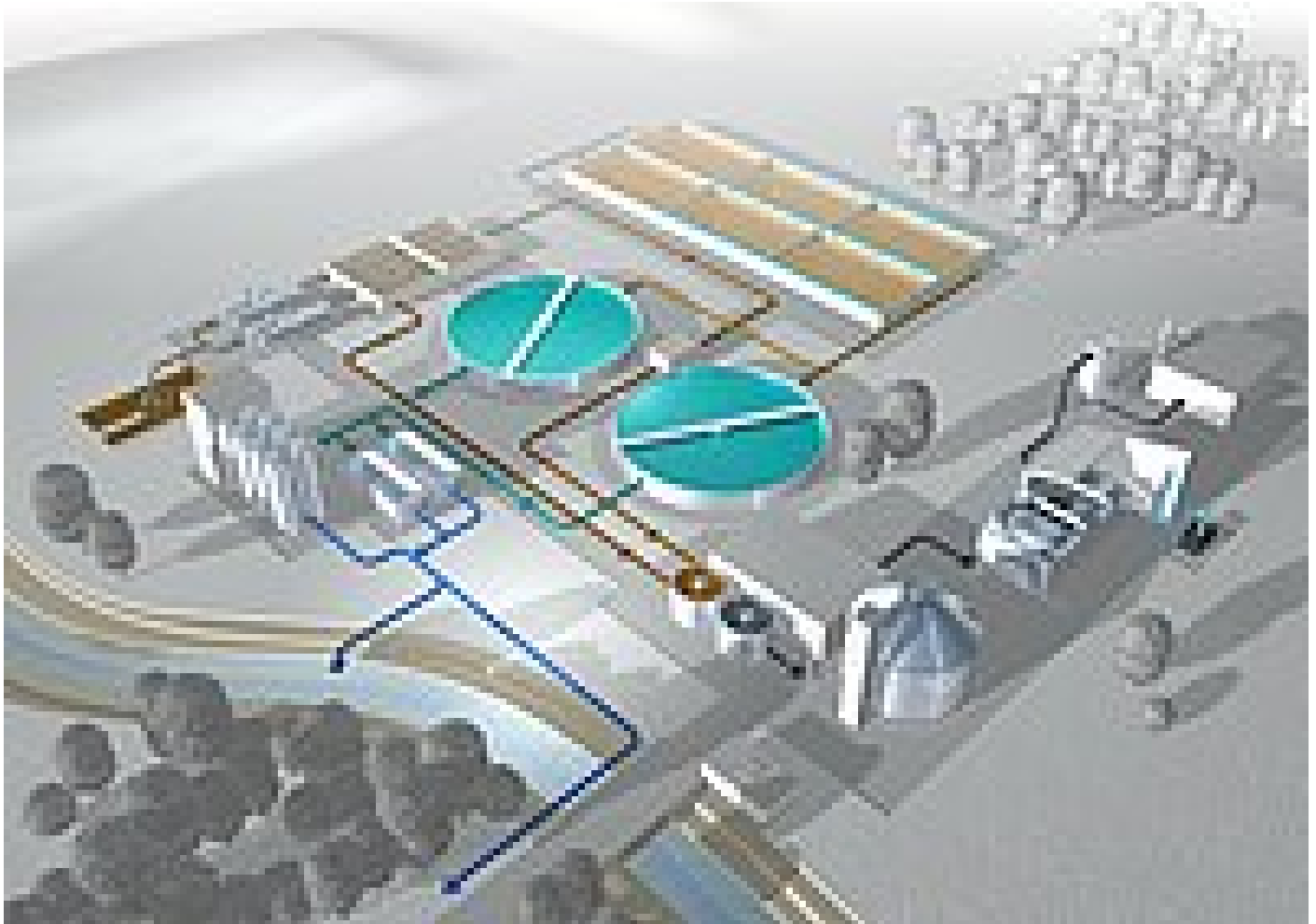


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Energy Consumption of Wastewater Treatment Plants



Specific power consumption of state-of-the-art wastewater treatment plants should be between 20 and 45 kWh/(PE•a) [PE = Population Equivalent or unit per capita loading]. The lower figure applies for large plants serving > 100,000 PE, while the higher figure applies for around 10,000 PE. The smaller a plant, the higher is its specific power consumption. The figures refer to power consumption and do not take on-site power generation into account.

Power consumption depends not only on a plant's size, but also on its design. Above figures apply for plants with N and P removal and anaerobic sludge digestion. Plants without nutrient removal consume less energy; plants without anaerobic digesters consume more.

Of course, efforts to save energy must not jeopardize wastewater and sludge treatment quality, but improved energy-efficiency usually concurs with more effective treatment and operation.

Thorough investigations of 23 treatment plants in Germany and Switzerland showed that their power consumption could be reduced by between 20 % and 80 %, in average by about 67 % [Handbuch – Energie in Kläranlagen, 1999].

Such savings could be achieved in spite of the fact that most of these plants had been built or modernized recently, had already modest power consumption, and were provided with power-heat-cogeneration (PHC) systems.

In all cases, the achievable power cost savings far exceeded the required investment and operation costs – in average by about 50 %. Energy efficiency improvements are almost always economical!

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