

**den Boer, E., Szpadt, R. Life Cycle Assessment of the Waste Management System in the City of Wroclaw. *Ochrona Srodowiska* 2012, Vol. 34, No. 3, pp. 39–44.**

**Abstract:** Life cycle assessment (LCA) was carried out to select municipal waste management scenarios for the city of Wroclaw, assuming the time horizon of the year 2020. The results of LCA have clearly shown that among the analyzed scenarios the most advantageous is the one combining increased recycling with thermal treatment (incineration) of residual mixed waste, because this option provides the highest energy recovery. The scenario with anaerobic stabilization of the biofraction during mechanical-biological treatment of the waste is a more advantageous option than the one with aerobic stabilization, owing to the potential for energy recovery from biogas. Biogas is entirely considered as a renewable energy source (RES), while only 42% of energy from waste incineration is regarded as RES. The refuse-derived fuel (RDF) fraction sorted out during mechanical-biological treatment of the waste can be used in a cement kiln as a substitute of hard coal for the generation of heat energy, but far more friendly for the environment would be the use of RDF in the co-combustion technology applied in power and heat generating plants. The least advantageous among the analyzed scenarios of waste management was found to be the current scenario where direct landfilling is the preferred disposal option. Rational waste management contributes largely to the reduction in global, economic-activity-related emissions of wastes to the environment in general, and to the atmosphere in particular.

**Keywords:** Life cycle assessment (LCA), municipal waste, thermal treatment, mechanical-biological treatment, recycling, energy recovery.