



Keynote Lectures

ENERGY FROM MUNICIPAL SOLID WASTE: LARGE-SCALE INCINERATION OR SMALL-SCALE PYROLYSIS?

Adisa Azapagic

*School of Chemical Engineering and Analytical Science, The University of Manchester, Manchester M60 1QD, UK, Email:
adisa.azapagic@manchester.ac.uk, Tel.: +44 (0) 161 306 4363*

Abstract

Municipal solid waste (MSW) management is an important and challenging issue for sustainable development. It is also one of the most controversial problems and a subject of an ongoing debate between different interested parties. A particularly controversial issue is MSW incineration (with or without energy recovery) which has in many countries become a socially unacceptable option for dealing with solid waste. On the other hand, the increasing amounts of waste each year demand immediate and practical solutions to the problem which currently cannot be solved by recycling alone. This paper addresses the issue of using MSW as an energy resource and attempts to identify a more sustainable technological option for energy recovery. The question posed here is: is it environmentally more sustainable to use a large-scale centralized incineration or a small-scale distributed pyrolysis/gasification of waste? The two options are evaluated and compared on a life cycle basis, using Life Cycle Assessment (LCA) as a tool. The LCA results show that the choice of a more sustainable option depends on the motivation for thermal treatment of MSW. If, for example, the main aim is to reduce the amount of solid waste being landfilled (while still recovering energy) and so comply with the EU Landfill Directive, then large-scale incineration appears to be an environmentally more sustainable technology overall. If, on the other hand, the main aim is to recover energy from waste, small-scale pyrolysis with gasification is an environmentally better option.

Keywords: municipal solid waste, incineration, pyrolysis, gasification, LCA, sustainability
