# TREATMENT AND ENERGY UTILIZATION OF MUNICIPAL AND INDUSTRIAL SOLID WASTES WITH THE PLASMA GASIFICATION TECHNOLOGY

Epaminondas Voutsas

*Thermodynamics and Transport Phenomena Laboratory, School of Chemical Engineering, National Technical University of Athens*
*9 Heroon Polytechniou Street, Zographou Campus, 15780 Athens,*
*Tel.: 210 772 3971, e-mail: evoutsas@chemeng.ntua.gr*

The excessive amounts of municipal and industrial wastes generated by the developed countries combined with the disadvantages presented by the conventional waste management techniques, enforces the need for innovative and environmentally friendly techniques, capable of treating and exploiting waste in a more effective manner. Given the rising world energy needs, the production of electricity is probably the most significant alternative for the utilization of the waste energy content.

Plasma gasification is a technologically advanced and environmentally friendly waste treatment process that converts waste to usable by-products. It is a thermal process that takes place at very high temperatures in an oxygen starved environment, aiming to the complete decomposition of the input waste into very simple molecules. The products of the process are a combustible gas, consisting mainly of hydrogen and carbon monoxide, known as synthesis gas, and an inert vitreous material, known as slag.

This work presents an overview of the plasma arc technology, including its benefits and drawbacks, as an integrated process for the treatment and energy utilization of municipal and industrial solid wastes.