

TOMORROW'S CITY AND ITS WASTE EUROPEAN RESEARCH PROVIDES TOOLS FOR A BETTER GLOBAL MANAGEMENT OF MUNICIPAL SOLID WASTE

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EXTENDED ABSTRACT

The production of municipal solid waste (MSW) in Europe is increasing despite the preventive efforts undertaken at various levels in each country. European legislation is continually evolving in an attempt to force communities to (a) reduce waste at its source, (b) promote recycling, and (c) minimise landfilling. However, the decision-aid tools available to municipalities are generally too approximate to enable a global approach to waste management. The stake is nevertheless of major importance to enable cities and industrial operators to:

- evaluate the present situation in terms of waste processing efficiency and cost, energetic balance, residual streams and emissions to the environment,
- accompany, control and reorient the choices,
- define and plan sustainable degrees of progress,
- improve the implementation of the concept of integrated municipal solid waste management.

The European research programme AWAST is aimed at helping to answer these questions by designing a Waste Management Aid Tool. That type of problems of "design and optimisation" has been addressed since years in Industry through process analysis methods, which rely on modelling and simulation techniques. The approach of AWAST is to use that scientific background to set up a simulator dedicated to waste management problems and to validate its interest through studies of three municipalities: Orléans, Stuttgart and Lisbon.

The implementation of a simulation study starts with a description "as faithful as possible" to the system under study: this is called "simulator of the existing situation".

This first phase already constitute a major problem. The definition of waste, the geographical and functional description of flows, the estimation of quantities and composition in these flows necessitate the use of well-controlled methods, as the Materials Flow Analysis and Substances Flow Analysis. The waste management system is represented by a diagram of flows and processes. Each flow is characterised by reference to the European Waste Catalogue, adapted to the available and measurable data. To achieve the simulator of the existing situation, each process is described by a "model" able to calculate the mass transfer, the energy balance and also the internal costs of the process.

The second step deals with "hypothetical situation". The scenarios concerning the global organisation of waste management, but also the improvement of one particular process can be tested and compared to the current situation.

Key words: Municipal waste management, simulation, matter balance, energy balance, costs.