



Environmental Newsletter

Prepared by WG-5 Environment

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WASTE MANAGEMENT

1. Summary

This newsletter is intended to provide information to plant managers, directors, technical directors and environmental specialists about best practices for waste management and minimization in industrial and medical gas plants.

2. Introduction

Each year the European Union disposes of 3 billion tonnes of waste - some 90 million tonnes of it hazardous. This amounts to about 6 tonnes of solid waste for every man, woman and child. It is clear that treating and disposing of all of this material – without harming the environment – has become a major headache for Member States. Most of what we throw away is either burnt in incinerators or dumped into landfill sites (67%).

European policies are based on the "polluter pays" principle, proximity in waste management and choosing the best option (hierarchy of waste management): first prevention, then energy and waste recovery and last landfilling. Incentives to adopt good waste management practices include landfill and incineration taxes.

Other policies include increased use of secondary materials, e.g. by products, use of composite materials and to work with suppliers.

3. Legislation on waste management

The owner of the plant, as a waste producer, must comply with the applicable legislation on waste management. This includes legislation issued by the European Union, the Member States, the Autonomous Communities or Regions and Local Councils.

European Union Legislation: Minimum requirements (Directives) have been established for the Member States to develop, except for the following fields where European Regulations or Decisions have been passed:

- Establishment of a list of wastes indicating which wastes are hazardous or not (EWC).
- Criteria of acceptance of waste at landfills.
- Procedures for the shipment of waste.

The general criteria for waste management developed by means of European Directives are:

- Identification of waste, priorities and principles in waste management.
- Establishment of authorisations and registries.
- Set-up of waste management plans and programmes.
- Internal management guidelines: mixture, labelling of hazardous waste, etc.
- Inspection and some issues related to specific types of waste.

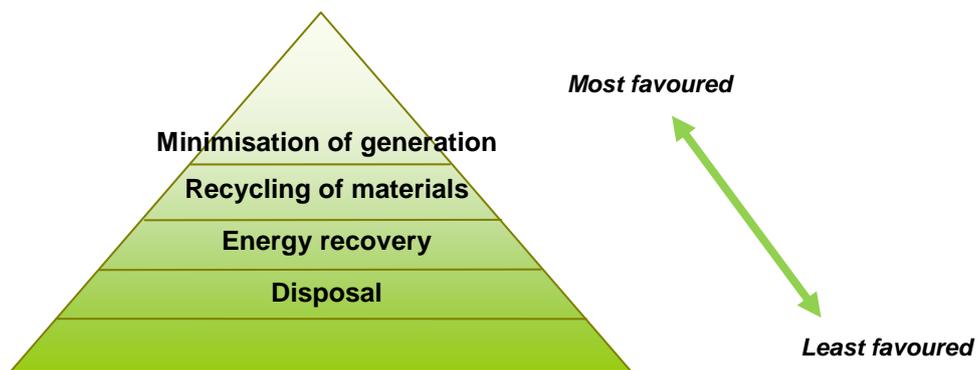
Local legislation implementing this includes:

- Authorization or registration as hazardous waste producers.
- Contracts with waste managers authorized for the area and waste in question.
- Filing of all the documents related to waste management: acceptance by the manager, collection of waste (control and monitoring documents, certificates of delivery and collection, etc.), and notification forms for transfers between Communities.
- Requirements related to the labeling and storage of hazardous waste.
- Annual waste production declarations. In the case of some specific wastes there can be other annual declarations or inventories (on packaging, PCB/PCT, etc.)
- Integrated Management System (IMS) for some types of waste (hazardous or not): packaging, waste electrical waste and electronic equipment (WEEE), used tyres, used oil, end-of life vehicles, etc.
- There are other specific legal requirements for each type of waste.

4. Principles of improvement in waste management

Principles of hierarchy of waste management

Any proper internal waste management in a plant should take into account the hierarchy of waste management established by the European Union, choosing the best possible option in each case, i.e.:



Good environmental practices in waste management

EIGA has published several documents detailing the best environmental practices in waste management: *Good environmental practices for the gas industry (Doc. 88)*, whose appendixes include charts with the best environmental practices for each type of waste and installation or activity.

Examples of good practices, according to the type of waste and activity are:

- Use Lime as a useful by product instead of a waste.
- Re use of construction materials.
- Re use and recovery of oils.
- Scrap metals - separating composite material.
- Catalyst regeneration.
- Separate waste electronic equipment and batteries.

In any event, the waste shall be managed by an authorized manager and according to the legislation in force.

5. Waste management optimization – action plan

In order to optimize waste management and minimization, plants should have an action plan that includes the following key points:

Step 1: Commitment and resources

As in other cases, environmental improvement requires the commitment of senior management staff from the outset, especially if some resources are needed to do research, to implement new internal procedures or to modify contracts with managers or suppliers.

This commitment may be achieved once the current situation has been analysed (step 2). The possibilities for improvement detected will also lead, in the medium term, to save waste management costs and to enhance process efficiencies.

Step 2: Preliminary review

The preliminary review consists of:

- collecting waste management data;
- assessing information gaps; and
- deciding whether to present a detailed waste balance to the company.

The preliminary review implies analysing waste management costs and waste generation data. Also, a market study would be useful to establish targets to improve the internal management of the plant (for example if there is no authorized company for a treatment, this option will be rejected although it may be the best environmental option).

It is recommended that the following information is gathered for the preliminary revision:

- Analysis of the waste management data collected throughout the year, as well as other operational control records from the Environmental Management System (see Guidelines for environmental management systems, EIGA document Doc.107).
- Data about the production of each process, collected by each department manager.
- Data about the purchases of waste-generating raw materials and the contracts with waste managers.

In order to identify the key points of waste generation, visit the plant and talk to the staff, who can help to find out the causes of waste generation and the possibilities for improvement (e.g. waste is due to a problem with the equipment, human failures, etc.).

The result of this step is the collection of economic data and a checklist that will be the basis for the waste / materials balance.

Step 3: Waste/materials balance

The outcome of the waste / materials balance will depend, to a great extent, on the validity and accuracy of the data collected. This will be the basis for defining, more or less successfully, the procedures to follow.

Summary:

- The first step implies creating a “picture” of the current situation as regards waste generation and management.
- Identifying the flow of waste generation by means of a chart: operation or process, collection point (how the separation is made, security measures, etc.) and quantity generated.
- In complex situations, flow charts can be used to identify at which point during the process waste is generated and which equipments/operations/plants/materials are involved.
- The waste balance and the current management data show the areas for improvement in waste generation, internal and external management. For example, a change in raw materials, certain

equipment (or its maintenance) or the performance of an operation could possibly generate less waste. Also, operations of assembly or segregation can make waste management easier.

- According to the information gathered, awareness campaigns can be organized for the staff, and contracts with managers/suppliers can be modified.
- The plans and objectives, as well as the balance of materials/waste, will be regularly reviewed and updated.
- The creation of management platforms that include companies from the same sector to optimize the management of a certain type of waste in a geographical area (by means of integrated management systems).

6. Actions

Members of EIGA should undertake to:

- Conduct the best practices for minimising waste generation and optimizing waste management.
- Understand and comply with legal requirements (authorizations, control of documents, contracts of the managers, etc.).
- Perform internal control and awareness campaigns as regards waste management.

7. Comments

Members of EIGA WG-5 Environment are pleased to receive comments about this or any other publication.

Waste Management Data Checklist

Type of data / information	Description
Costs of current management by type of waste and sector	Invoices of waste managers/contractors, including renting of equipment, penalties for manager's waiting time, control and monitoring cards, acceptance cards, etc.
Available resources: containers, cans, compression machines, etc.	Inventory of the resources, maintenance and rotation thereof.
Is there any treatment?	Pre-treatment and study of the possibilities for pre-treatment so that the external waste management is easier and less expensive
Management by type of waste. Is there a better option? Internal segregation, external management (frequency, storage and assembly system, etc.)	Analysis of the current management process taking into account: <ul style="list-style-type: none"> • Proximity. • Best environmental option available. • Only a manager will carry out an integrated waste management for all types of waste (thus intermediate managers are avoided). • Current good environmental practices.
Raw materials and their relationship to the waste	Balance of entries and exits for each process. Is there any relationship with the generation of waste?
Packing systems	Type of package, packing of raw materials and final product. Optimization to reduce this kind of waste.
Details of processes/units or waste-generating operations	Process analysis: optimization of equipment, work methods, predictive maintenance, etc. Is there any equipment that creates a specific type of waste (due to failures or because of the equipment's normal operation)?
Plans of the plant	Including points of waste generation and flows of internal management: situation of the containers and the internal movements of the waste up to the final storage point before external management.
Review of the waste storage area → prevent leaching	Refer to ENL 19 Site spill prevention plans

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