The European Union's Tacis programme for Ukraine

# CAPACITY BUILDING IN DONETSK OBLAST FOR WASTE MANAGEMENT - UKRAINE

*Report*

## *Strategy for Local Action Plan*

This project is funded by the European Union

A project implemented by

Sogreah

PÖYRY GKW

ADEME

**Documents management**

| | | | |
|---|---|---|---|
| Title | Strategy for Local Action Plan | | |
| Code | 061225 Strategy for LAP E.doc | Date Redaction | 25/12/06 |
| Index of Revision | | Emitter | Philippe FICHAUX |

**Recipients**

MENTRÉ Jérôme
PLAIGE Benoît
FICHAUX Philippe

**Warning**

This programme is implemented by the Consortium Sogreah – PÖYRY GKW - ADEME. The views expressed in this report do not necessarily reflect the views of the European Commission.

# Table of contents

# 1. Rationale

## 1.1. Commitments

We are obliged to refer to the ToR and to the proposition we made. Within that last one, there's a chapter "Rationale". Let's remind what we wrote.

*2.3 – Contract objectives*

*The overall projects objectives focus on the development of democracy and market economy. Waste issues are a very political issue for several reasons. A major one is the challenge to switch Ukraine economy and society to a sustainable development, as Ukrainian government committed itself through the Rio de Janeiro and Johannesburg conferences.*

*2.6 – Strategic Plans*

*The Regional Strategic Plans will have to be implemented at the municipal level. The best way is that the municipalities and the counties develop their own local operational plans, taking into account the objectives and the decisions of the Regional Strategic Plan, and programming their investments and reforms.*

In the chapter Strategy we wrote:

*Task 3 – Action plans for similar actions in other cities of the Oblast developed and approved*

*The Consultant will prepare an action plan which will identify the activities to be undertaken to disseminate the results of the implementation of the new schemes and the pilot Project. As part of the action plan, the Consultant will prepare practical manuals or guidelines for implementation of the new schemes in all municipalities in the Donetsk Oblast.*

*A methodology will be presented for monitoring the progress of the pilot Project.*

*The Consultant will make sure that the Project will be sustainable after the end of the Technical Assistance by preparing specific actions (legal and financial grounds, fee-collections, development of capabilities inside municipalities and consulting companies etc.).*

*The Consultant will select a number of cities that will participate in the implementation of the new schemes. The choice of the cities will be based on geographic, socio-economic criteria but also on the coherence of the actions in waste management in a large zone (for instance one can imagine to select cities situated in the vicinity of the sorting plant) and the motivation of the city authorities (very important point).*

*The Consultant will draft for each city a specific action plan addressing the specific adaptations of the plan, according to the conditions of these cities.*

And:

***Local Action Plans (LAP)** are planning schemes adapted to structure the waste management system according to the Regional waste strategy framework. It describes and evaluates the existing situation, identifies waste management issues and problems, and finally elaborates appropriate development and improvement measures. Worked out in a transparent and dialog way, by different stakeholders involved in the waste sector, from producers to waste companies, including customers and NGO, it has to be adopted by appropriate self-government bodies (oblast, rural counties or city council) as a component of environmental protection programs. Among the 28 cities and the 17 rural counties the Consultant will work out LAP with 5 local authorities with the relevant methodological guides (see Task 3). The LAP should include a programme of investment for containers, trucks and transfer stations.*

All that are very good principles and the Delegation agreed them.

## 1.2. Definitions

### 1.2.1. Development

*It's better to be young, beautiful, rich and healthy than old, ugly, poor and ill.*

We know the situation of the municipal services in Ukraine. The decentralisation let duties and responsibilities to the LSGB and the LSA with very limited means. The first key-point is the system of yearly negotiation between the LSGB and the State (throughout the Oblast Administration) about the

sharing of the taxes and the subventions. The second key-point is the distinction between a municipal policy of development and some tools for the development that are the services provided by the municipal services and which are to be seriously developed.

At the city's scale development may mean:

- Economical development:
  - Development of employment;
  - Improvement of the incomes of the inhabitants;
  - Development of the commerce;
- Social development:
  - Improvement of the health system;
  - Improvement and development of the education system;
  - Improvement of the canteens;
  - Development of the offer of culture;
  - Reduction of poverty;
- Community life improvement:
  - Quality and availability of supplied water;
  - Efficiency of cleansing (street cleaning, sewage, waste collection);
  - Efficiency and availability of district heating;
  - Quality and availability of electricity and gas;
- Comfort development:
  - Quality and efficiency of public transports;
  - Improvement of the relationship between inhabitant and administration;
  - Development of the recreational equipments (parks, swimming pool, etc.);

All these components can become goals for a municipality. But if a Mayor and a Municipal council decide targets for these goals, they will be implemented by the municipal services.

No Mayor will say "I don't want development for my city!" But between the grey today and the bright future, there are a lot of steps.

### 1.2.2. Sustainable

In 1974 the Rome's Club said "Stop to growth". In 1992, Rio Summit said "sustainable development". Both were right. Earth's resources are limited and humanity must stop to waste and spoil them. So a sustainable development is more and more often based on quality than on quantity. For instance, the individual car is a great element of comfort but it will stay affordable for the energy resources of the planet if the fuel consumption per km continues to decrease.

A first acceptance of sustainable is the reduction, the control, the suppression, of the impact on environment. It is the respect (if not the improvement) of the quality of the environment, within a very long-term perspective (respect of future generations rights).

But there's another acceptance of sustainable. The development is the fruit of an investment. It doesn't come miraculously from heavens. By this way, a development can be sustainable under the condition the investment is affordable. And investment is not only money: it's also a personal investment of each one in new behaviours.

- Sustainability
  - Reduction of energy consumption for the same service;
  - Reduction of water consumption for the same service;

- Zero level emissions in water, in air, in soils;

- Affordability
  - Consensus for new constraints (as selective collection) and change of habits;
  - Consensus for payment of the true cost;

### 1.2.3. Policy, strategy, tactics

There are so many things to do, there's everything to do, there are emergencies everywhere.

The role of a policy is to determine goals and to prioritise the goals. Each action toward one goal has side effects on other goals. Some goals may be preliminary steps for other goals or facilitate other goals. For instance an improvement of the quality of the water will improve the public health, and a reduction of the water consumption will make easier the wastewater collection and treatment.

Then the strategy plans the actions, the targets, the means.

During the action, the tactics is the capacity to optimise the use of the means and to react to unforeseeable.

But it's usual to forget that policy, strategy, tactics must adapt to the evolution. The condition is to dispose of feedback mechanisms. If there's a top-down logic Policy – Strategy – Tactics - Reality, there's a bottom-up logic of the feedback Reality – Tactics – Strategy – Policy. And as unfortunately the feedback is not a natural phenomenon of the organisations, it must be managed.

## 1.3. Criteria of prioritisation of the action

### 1.3.1. Hierarchy

All was said in 1.2.1 seems us to be necessary from our EU point of view. But the means oblige to proceed step by step. It's not bad to use the scale of needs of Maslow in aim to propose a hierarchy of the possible actions.

- Physiological needs
  - Quality and availability of supplied water;
  - Efficiency and availability of district heating;
  - Quality and availability of electricity and gas;
  - Reduction of poverty;
  - Housing for everybody;
  - Improvement of the canteens;
  -

- Securitization needs
  - Development of employment;
  - Improvement of the incomes of the inhabitants;
  - Development of the commerce;
  - Improvement and development of the education system;
  - Protection of childhood;
  -

- Comfort needs
  - Improvement of the health system;
  - Quality and efficiency of public transports;

- Development of the recreational equipments (parks, swimming pool, etc.);
- Efficiency of cleansing (street cleaning, sewage, waste collection);
-

- Acknowledgement needs
  - Improvement of the relationship between inhabitant and administration;
  -
- Blossoming needs
  - Development of the offer of culture;
  -

This list is only an example. The meaning is to wonder each time there's a topic to take into account as a possible development "which level of needs of the population it will answer", because, by experience, people who have no water don't care for medals or titles. But one topic can answer several levels of needs: for instance, improvement of the canteens answer physiological needs for the parents but also acknowledgement needs for the children.

### 1.3.2. Conditionality

Some actions are conditions for other actions. For instance, "Quality and availability of electricity and gas" is necessary for the physiological needs of the inhabitants but it's also a condition for the development of industry and commerce, for the quality of the public health system (hospitals), the efficiency of public transportation (trolleybuses, tramways), etc.

### 1.3.3. Domino effect

One action can solve a problem and simplify the solution of the next. The most obvious example is that it's proven that the key-factor of the increase of life expectancy on 2 centuries is the development of the public sanitation (drinkable tapwater, wastewater collection and treatment, waste collection and disposal).

### 1.3.4. Countercurrent benefits

A good example of this approach is tapwater.

The local use is to open the tap all day long.

To install individual counters can modify this behaviour and reduce the consumption of the flat.

To switch off should reduce the quantity to deliver to the building.

To repair the leakages of the pipes should reduce the quantities to produce.

At the end, it may appear that the renovation of the reconstruction of the water supply facility could be downsized because the real consumption (use by the user) is 10 times less than previously. By contrary, if you begin by the reconstruction of the water supply facility, when the network will be repaired and the counters installed, its size will be 10 times too big.

### 1.3.5. Causes and effects

Some topics are problems by themselves but are also the main cause of other problems. Typically, the water resource is largely contaminated by the waste and the wastewater. It seems logical to improve the quality of the water resource instead to implement all the processes eliminating these pollutions for the production of drinkable water.

### 1.3.6. Geography

Some topics can be managed at the scale of the city but others can only be managed at larger scales, as the quality of water resource that is a question of water catchments.

### 1.3.7. Others

The question is not exhausted and a lot of other criteria may be pertinent. A common task of the experts is to develop this list.

The technical assistance to the municipalities is also to bring them to lucidity about some principles of management when preparing a policy and a strategy.

## 1.4. Waste Management and Sustainable Development

As it will be said further (§ 3), SHWM is a part of the global problem that LSG have to face. Frankly speaking, out of some particular cases, the disposal of SHW rarely causes harmful effects to environment and health. Of course, big cities generate big landfills that concentrate so a pollution that can affect the local environment. But SHW offer a big advantage in the matter of "new" management: they are "visible" although the other problems are not visible. Who will see pollution in air or in water? Who will see what is in the pipes? But accumulation of waste is very visible.

So we can consider that SHWM is an "easy to implement" first step of a new management of the municipal services and of new behaviours of the inhabitants.

Easy to implement because the material means are mobile (trucks and containers) and don't depend on huge networks to repair perfectly for an effective result (theory of the weakest ring of the chain).

Easy to implement because the inhabitants can see immediately the result with a neighbourhood clean of waste.

# 2. Building a strategy in municipalities

If the goals are more or less common, each municipality starts with specific means and in specific conditions. So each policy and each strategy must be tailor-made.

## 2.1. Diagnostic

There's no sense to define a policy and a strategy without an exhaustive understanding of the situation.

### 2.1.1. Figures and data

The first difficulty of all projects in former USSR is the weakness of the available data. They are often based on old norms (as for the waste, a study of Kharkiv Institute of 1987) or they are established without a strong methodology (each municipal company has to define its own method for the production of the waste statistics). For the "pipe" services (water, heating, gas, electricity), it happens often that there are no counters.

So the preliminary task is to establish realistic figures. It supposes, as we did for SHWM in Donetsk Oblast, to develop methodologies allowing to calculate with light means figures with a confidence interval of ±2%.

### 2.1.2. Understanding

The city is a piece of territory with a lot of specificities. Usually, the understanding of the problems requires to locate them. So the figures and data must be reported on maps and drawings.

But a problem lies on a lot of complex causes. The tool so-called "causes tree" or "fish diagram" allows to investigate all the causes concomitant to create a problematic situation. The interest of this tool is that it's often found that it's easy to remedy one cause that will reduce or stop the effects of the problem. It allows also to understand all the components and all the stakeholders of a problem.

### 2.1.3. Database and monitoring

Figures are "instant" data. They represent life and life is continuously changing. So the figures must, as soon as possible, be structured, organised and managed in database.

Any action will include a monitoring and will provide feedback information. The concept of database includes the procedure of collection of the figures and the update of the database.

### 2.1.4. Valuation of the problems

Once the problems are identified and quantified and located, they must be valuated.

The minimum is to calculate their economical cost: cost of the service, cost of the defects, cost of the non-service.

It's also necessary to calculate their social cost as in terms of impact on health, on education, etc.

One principle of sustainable development is to calculate their hidden cost: exhaustion of natural resources, pollution, remediation in the future.

## 2.2. Deciding a policy

Etymologically, politics is the management of the city (πολισ). The Mayor, help to the municipal council, must propose a sight of the future.

The policy of sustainable development is a document proposing an understanding of the situation and defining the hierarchy of the priorities and the main ways of action.

## 2.3. Strategy

The strategy is the programme of action. But the key-point is that programming action must be realistic, and realism is to take into account the available means.

### 2.3.1. Existing means

Usually the knowledge of existing means is theoretical. The Western approach is to audit the means in aim to check the quantity but also to assess the quality.

For equipments, quality is technical performance, degree of wear, practical performance, availability, and so.

For people, quality is competences, skills, capacity of adaptation and progress, availability, goodwill, ability to relationships, team spirit, etc.

### 2.3.2. Unlimited means

The drawback is to consider that nothing can change because we have not the means. The only strategy is to expect miracles.

Another drawback is to limit what I can do to the amount I have.

The right approach is to mind that all projects are feasible if they are bankable. The principle of true costs payment is that a service must generate the funding of itself throughout a credit.

A complementary approach is to look for virtuous spirals: the projects that will generate means for other projects.

### 2.3.3. Definition of concrete solutions

First it's creativity. Old problems will not be solved with old solutions. The key-word is "imagine". We have there a key-role: to bring new solutions to old problems.

The research of solutions includes their economical, technical, social, assessment. The cornerstone is that they must be bankable.

### 2.3.4. Structuring of concrete solutions

The implementation of a solution can depend on the solution of other problems in aim to get a better efficiency. So it's necessary to draw a diagram of logical implementation of the solutions.

All solutions cannot be implemented at once. The management structure is able to implement a limited number of solutions on a given period. The same, all solutions cannot be funded at once.

At least, it must exist other constraints as climate, time (winter is a key-factor), that are to be taken into account.

At the end, a rationale programme of implementation of the solutions can be written. It the Strategic Plan.

## 2.4. Implementation of a strategy

### 2.4.1. Co-ordination

The first step is to create a structure of management and co-ordination. This cell must dispose of the necessary means: people and equipments.

The projects manager must have an authority on the people who will contribute to the implementation of the solutions. The supreme authority is the Mayor but the head of projects must have a delegation.

The projects cell must periodically (and regularly) inform all services about the progress of works.

### 2.4.2. Programming

The implementation of the solutions (works and purchases) must enter in the usual administrative procedures. So the programming of implementation must take into account these procedures and their necessary duration.

Let's add that in our particular case, the EU grant has itself its own procedures and any IFIs loan will bring its own procedures. A particular task is to train the cities to these procedures.

### 2.4.3. Monitoring

The tasks must be fulfilled but also there are constraints of synchronisation of the tasks.

The projects cell must define and use a monitoring procedure.

### 2.4.4. Feedback loop

Reality evolves and our world is not perfect. From time to time, new facts may require to modify or to adapt the Strategic Plan.

There must be a procedure of adjustment of the Strategic Plan as a yearly revision.

### 2.4.5. From Plan to Plan

A Strategic Plan is usually defined for 5 years. At the end of the 3$^{rd}$ one, it's time to begin to prepare the next Strategic Plan.

# 3. Strategy of LAP

## 3.1. Modern management

Waste is a particular component of the usual municipal services. Most of them are invisible as they are in "pipes" as water, heating, wastewater, electricity, gas. Waste are on the kerbside and very conspicuous!

Let's remind the global stake. In Ukraine as in all countries of former USSR, the water resource is largely contaminated by the waste. Largely is very significant. Studies showed 25% of the territory was contaminated and the health cost for Ukraine can be assessed 10 000/y deceases and 10 000/y genetic malformations in newborn babies. So a very reasonable decision is to stop to worsen the situation. Waste is household waste, industrial waste, healthcare waste, hazardous waste, nuclear waste, and so. The most hazardous they are, the most expensive is their neutralisation, the most complex is their regulation and their management.

So logically, it's not bad to begin the waste management with the household waste.

What is a modern management of the waste?

The two previous chapters are for us basic and common principles of management. For Ukraine, it's modern management.

The priority objective is the safe disposal of all the waste.

In terms of strategy, the main steps are:

- Identification of the waste: nature and hazard;
- Identification of the production: who generates what?
- Safe collection of all the waste, according to their particular characteristics (liquid-solid, corrosive, chemical compatibility, etc.);
- Specific treatment of each waste and there it's possible to envisage several strategic approaches depending on the means:
    - Waiting storage: the waste are carefully stored until there's a good technico-economical solution;
    - Definitive storage in safe conditions: hazardous waste landfills;
    - Storage with neutralisation: household waste sanitary landfill, the biodegradation reducing the potential of pollution of organic compounds;
    - Neutralization: acids, etc.
    - Recycling: regeneration of solvents, of oils, transformation in secondary raw materials (glass, metals, plastics, paper and cardboard);
    - High temperature oxidation: incineration of hazardous waste.

The complexity of the problem is that the convenient geographic area is not the same for each step. The identification of the waste is a State regulation but more and more often, it's largely decided by international agreements, treaties and regulations. The identification of the production depends on the waste: it's municipal for municipal waste but it may be regional for industrial waste. The same for the organisation of the collection: municipal or regional. The treatment facilities may be local, regional and even national depending on the nature of the waste. And at least, a system may be pyramidal with local collection, regional grouping and national recycling or treatment facility.

These principles have been applied to the Regional Strategic Plan of SHWM of Donetsk Oblast as following:

- Identification of the waste: a distinction has been made between rough waste, recyclable waste, green waste, "monsters", household toxic waste;
- Identification of the production: the RSP has established synthetic figures;
- Safe collection of all the waste: daily collection and selective collection;
- Specific treatment of each waste with a strategic approach:
    - Sufficient capacity of sanitary landfills for 100% waste;

- Development of recycling capacities if possible.

The implementation must be either local, either regional. Globally the disposal is regionally managed and the collection is locally managed.

## 3.2. Logical framework

The new management of SHW is based on both:

- Regional management of the disposal: new regional sanitary landfills, plus eventually a help to regional recycling facilities as the PET plant of Slaviansk;
- Local management of the collection, plus eventually a help to local selective collection and local treatment as composting or pre-treatment as sorting centres.

Like that the objectives and the responsibilities are clear:

- Region: to safely disposed 100% SHW;
- Local: to collect 100% SHW and 100% fees.

## 3.3. Starting point

Our starting point is the Regional Strategic Plan of SHWM of Donetsk Oblast. The RSP gives a picture of the regional situation and the regional objectives.

As old solutions have not solved old problems, it appeared necessary to develop "new schemes".

## 3.4. Organisation of the action

### 3.4.1. Principles of action

Actions are works + supplies + workforce of cities employees and Tacis consultants.

It's commonly admitted there's a hierarchy of categories of actions for the implementation of a reform:

- Motivation
- Organisation
- Technology

Motivation is costless. It's +10 to +20% efficiency per annum.

Organisation costs a little bit. It may be +20 to +30% efficiency per annum. Anyway, a reform of organisation will never succeed without motivation to change.

Technology is expensive. Sometimes it may be +300% efficiency. But technology supposes to change organisation.

So the 1$^{st}$ approach must be: what can we do with what we have?

The second law is the Pareto's law: usually 20% of the problems cause 80% of the cost. By the contrary, 20% of expense can solve 80% of the problem. So the 2$^{nd}$ approach is to look for which little investment can offer a big benefit.

### 3.4.2. Local Action Plans

Complementarily to the regional landfills programme, the LSGB and LSA must organise their action for the improvement of the SHWM within their territory. For a so huge task, it's reasonable to schedule 5 years.

LAP is a contract, at least a moral contract between the authority, the inhabitants and the providers of funds that are the State and its Regional Administration. The LAP must indicate what are the tasks, the necessary means, and the organisation of the action. Within the organisation, all the stakeholders will

have a role to play: authority, municipal company, inhabitants, regional administration. Relays of action will be the NGOs and the mass media.

## 3.5. Implementation of the actions

It includes several components.

### 3.5.1. Follow-up of works

#### 3.5.1.1. Quality management

The standards package ISO 9000 is officially recognised by Ukraine but it's far to be known and applied.

The management of quality lies on an identification and a definition of the key-points of the provided service or product. If I buy that, what are the expected service and the expected level of performance? How to write that in the contract? How to check that? Who will check that (third party control or self-control)? What to do if the delivery is not conform?

#### 3.5.1.2. Purchase of performances

It's a new culture to implement in Ukraine. The key-point of a purchase is less the quantity of delivered goods that the service they will provide to the user.

#### 3.5.1.3. Norms and standards

The control is often described in norms and standards. For the moment, Ukraine is still disconnected from the universal systems of norms as ISO, CEN, IEEE, and so. But nothing forbids anyone to ask for international norms respect in the terms of reference of a purchase as far as they are complementary to Ukrainian requisites.

### 3.5.2. Enhancement of municipal services

#### 3.5.2.1. Maintenance management

The organisation of the maintenance in the municipal services reflects an economy of penury. It's common to see machine-tools and people re-boring engines blocks. It was impossible to find and to buy spare parts, so the services took the habit to do everything by themselves.

Maintenance management is set on:

- Preventive maintenance: to be able to predict the normal occurrence of the problems and to repair before they occur;
- First-level maintenance: the service must have means to do itself the current maintenance;
- Sub-contracted repairs and servicing: there are better specialists (and better equipped) for big or exceptional works;
- Management of the data: each equipment has its register of operation and maintenance; it allows to follow the ageing curve and to detect when catastrophic phenomena will appear.

#### 3.5.2.2. Training policy and management

French rule is to allocate 1% of the wages to the training of employees. Studies showed that there was a long-term correlation between the rate of training expenses and the performance of the companies. Ukraine has a big gap to fill up in methods, techniques, and so.

It's advisable to define a training policy: objectives and means.

For each employee objectives of competences and skills should be defined and a yearly training programme established.

#### 3.5.2.3. Human resources management

Municipal services don't pay a lot. They are not very attractive for young qualified people. The counterpart is that we see an ageing of the population of the municipal services. This situation of the pyramid of ages will become catastrophic some day: the accumulated experience and knowledge will collapse. This question must be managed.

### 3.5.3. Strategic management

#### 3.5.3.1. Budgets and finances management

The habit is to ask for State subventions and to do something as they come. The result is that a project can be funded and realised on twenty years and be obsolete the next day of its inauguration.

New funding must be a mix of subventions, credits, grants (why not) and self-funding. It supposes a management aiming at a development of the resources and at a mid-term visibility of these resources.

#### 3.5.3.2. Business plans and financial negotiations

A banker is torn between two objectives he has to fulfil:

- A yearly objective of amount of new loans;
- A maximum rate of failure on his portfolio of loans.

So he needs projects but he has to be sure they are good projects.

A business plan is not (only) a beautiful Excel table. A business plan must demonstrate that the risks have been identified and that solutions are scheduled in aim to limit if not to avoid the risks. The borrower must integrate that the financial negotiation with a banker is focused on risk management.

#### 3.5.3.3. Projects management

The first condition for projects is to yield means (organisational slack). To manage project is not an additional tasks that piles up on the others. To make projects means to allocate time and means for that.

For the rest, it's a full chapter summarized in **Erreur ! Source du renvoi introuvable.**.

### 3.5.4. Technological update

#### 3.5.4.1. Norms and standards

The progress of technique is written in norms and standards, or should be. Ukraine still uses a lot of norms (Sanpin) for the way to make works or products that are inherited from the former USSR and that are still applicable. The worst is that, legally, all works should be done according to these prehistorical norms.

#### 3.5.4.2. Documentary database

The technological progress is a knowledge and must be managed as such. A bureau of project must collect and manage a technical documentation on the products it can use some day.

#### 3.5.4.3. Purchases management

The purchases management is an organisation taking into account all the events from the demand of buying to the payment of the provider.

### 3.5.5. Participative democracy and public awareness

A key stakeholder is the inhabitant as user or consumer of the services. His behaviour is fundamental for the improvement of the services. But in fine he is also the payer by his fee for the use of the commercial services and by his taxes for the non-commercial services. By the way, he has a right to be informed and

to participate in the decision process. Let's add that the Aarhus Convention obliges to organise this public participation for decisions concerning environment.

## 3.6. Lessons and guidelines

Just let's notice a lot of existing works, specifically within the frame of the accession to EU of Eastern Europe countries, as the publications of the Regional Environmental Centre for Central and Eastern Europe (REC).

# 4. Procedure of a LAP

The LAP is focused on SHW collection. It is supposed the disposal is managed by the Oblast within the Regional Sanitary Landfills Programme. Nevertheless, as the disposal in these landfills must be paid (fee per tonne), the local authority can reduce the quantity of SHW to be disposed help to recycling and domestic composting.

## 4.1. General rules


Biblio [2] ***Graph 1 Local Environmental Action Project Flowchart of Project Activities***

### Biblio 1 Identify Goals and Scope of the Program

Every community should begin planning for new or continuing source reduction and waste management programs by first discussing the goals it is trying to achieve. A key goal should be source reduction which will eliminate the need to manage community waste. There are also many other valid goals; these include complying with state and federal law, protecting the environment, providing local business and job opportunities, and saving resources. By defining goals, the community can better determine the type of program it wants.

For example, if a community is interested only in the economic benefits of a recycling program, it may choose to recycle only the most cost-effective items, such as aluminium. Items that are more costly to collect or have low market prices such as plastic may be excluded from the program. On the other hand, if a community's goal is to preserve landfill space and conserve resources, the community may decide to strongly support source reduction and to collect a larger variety of items, even if collecting some materials results in higher unit costs. Defining community goals up front will make later decisions about program scope and degree of economic commitment easier.

Once goals are determined, the scope of the intended program must be defined. Will the program be community wide? Will a regional approach cover all sectors, including residential, commercial, and industrial sectors? By answering these questions, the proposed program will be put into focus. Defining program scope will help develop program organization and ensure waste characterization analyses are useful and cost effective.

**The community should define its goals and constraints.**

Each community should clearly define the goals for its collection system, periodically review the system's performance in meeting those goals, and regularly review and adjust the system's goals to conform to the community's changing needs.

To define collection system goals, consider the following issues:

- the level/quality of service your community needs
- the roles to be played by the public and private sectors
- the community's long-term waste management and source reduction goals
- preferences for and constraints on available funding mechanisms
- existing labour/service contracts that may affect decision making.

Biblio 1 The process of establishing a waste management program is lengthy and complex. As the process moves along and problems arise, it is easy to get bogged down in the everyday details of program implementation. Frequently, an immediate problem can take precedence and seemingly overshadow all other considerations. Although the need to break a complex problem into small, workable units is human nature, the "big picture" must always be kept in focus.

As a community moves toward program implementation, managers must constantly remind themselves to keep the overall program in perspective. By viewing the project as a whole, no individual element will be given too much or too little attention. Program momentum will be sustained at a slow, but steady, pace. Issues that can delay or derail a program will be recognized and dealt with. Public support will be fostered and confidence in the ability of the community to successfully implement a program will grow.

To keep a waste management program in its proper perspective, attention must be given to the five "Ps"; that is, planning, price, publicity, politics, and perseverance. By always remembering the five Ps, program developers will give their programs the greatest chance of succeeding. Conversely, if any one of the Ps is ignored or forgotten, the program has a great chance of failing. Each of these issues is discussed briefly below.

**Planning**

Although it may seem obvious that planning is needed to implement a successful program, in practice, the need to formulate and follow a well-devised and comprehensive plan is sometimes forgotten. A leaking landfill or other waste management problem may pressure a community to act quickly; hasty actions cause mistakes, which in turn result in delays and wasted resources. While all possible situations

cannot be anticipated, many good models based on successful programs do exist, and program developers are encouraged to use them when possible to formulate their own programs.

For example, in waste-to-energy projects, a number of communities have run into trouble because financing expertise was not brought into the planning process early enough. After significant resources were committed to technical analysis, the capital markets were consulted only to reveal that the technical information compiled and recommendations made were inadequate to provide proper support to obtain capital financing. As a result, the technical analysis had to be redone, which added cost and delay to the project.

Planning is especially important because of the potentially large number of actors in the waste management process. Political bodies, waste generators, waste haulers, regulatory agencies, construction contractors, plant operators, energy and material buyers, landfill site owners, and citizens must all be included for a program to be successful. Each group has the potential for delaying or derailing a project. By formulating and continually reviewing a project plan, program managers can minimize the chances that a major component of the program will be missed.

**Price**

Decisions regarding the adoption of alternative strategies for managing waste must continually be based on sound economic analysis that considers the resources of the community and the anticipated environmental impacts and benefits. The community is usually willing to support higher cost waste management options as long as there is confidence that the program is well run, economically efficient, and environmentally sound. Each management approach carries a price tag. Comparing costs and benefits before action is essential to long-term success.

**Publicity**

Successfully implementing a waste management program can take a number of years and a commitment of community resources worth many millions of dollars. While the decision to pursue a certain option is often met with great fanfare, support for a program can erode quickly unless attention is given to keeping the program on the public agenda and maintaining strong and positive public support. A plan for informing the public about the program's progress should be developed and implemented as the program proceeds. Special effort should be made to generate public support before public bodies vote on program expenditures. The program must be seen by the public as something to be proud of, as an example of the progressiveness of the community and its commitment to a clean environment.

**Politics**

As with publicity, sustaining political support during the long and costly implementation process is vital to the program's ultimate success. When local government budgets are tight, a program may not survive the budget cutter's knife unless there is continuing, strong political support. Political support is often crucial to obtaining financing and ensuring that the program gets the resources needed to construct facilities and operate them efficiently. Political leaders should also be kept informed of the program's progress on a regular basis so that political support for the program grows as the decision-making body reaches the point of actually committing its public or private resources to implementing the long-term program. Newly elected political officials must also be educated concerning the community effort.

**Perseverance**

Finally, a community considering a waste management program must be prepared for the long term. Some projects can take five to ten years to implement. Such programs are complex, expensive, and often frustrating. A community choosing to implement a program must be willing to commit the necessary resources to see the program through. The ultimate key to success is the will to persevere until the program is in place; the thousands of successful programs underway nationwide attest to this.

## 4.2. Organisation of the job

Who is responsible of the LAP for SHWM?

It's the first decision to be taken. To define and to implement a LAP is a big task. The EU practice is to name a chargé d'affaires who will report directly to the Mayor or to the Director of the Services. He does the job and prepares the decisions for the local authority.

A working group is built gathering all the involved services. The role of the working group is to exchange information and to collect information for the LAP. His key-role will be to say what is possible to do or what practical difficulties must be solved.

A system of information meetings is created in aim to associate the population and the NGOs to the process. By experience, population and NGOs don't bring added value to the definition of the LAP but they will be the main actors of the "on-the-field" implementation of the actions. Let's note that from time to time NGOs are very helpful to "shake" the inertia of the services but it must be used with the most extreme prudence.

A policy of communication is immediately defined. This policy programs which messages for which target in aim to arise public awareness and services awareness. The mass-media are tools of communication among others. They will be associated with pertinence: at particular moments for particular messages.

## 4.3. Understanding the situation

Biblio [1]No matter which waste management approach, or combination of approaches, a community decides to adopt, a variety of data must be collected and analysed before the program can be implemented. The community's goals and the scope of the program must be set. The community must also understand its current and future waste generation profile in order to plan and finance an efficient and economical program.

Reliable information will allow the community to accurately budget for program needs, make it possible to design appropriately sized program facilities, and allow the community to better assess the program's success after it is implemented.

| | |
|---|---|
| **Determining goals is the first step—source reduction should always be included.** | Communities should begin planning for new or continuing source reduction and waste management programs by first discussing the goals it is trying to achieve. A key goal should be source reduction which will eliminate the need to manage community waste. There are also many other valid goals; these include complying with state law, protecting the environment, providing local business and job opportunities, and saving resources. By defining goals, the community can better determine the type of program it wants. |
| **Characterizing the community's waste is a crucial step.** | Developing a successful waste management program requires accurate up-to-date information about the community's waste profile—what types of waste are generated, in what quantities, and how much of it can realistically be prevented through source reduction and collected for recycling.<br>The type of waste management program being considered will help determine the degree of detail needed in the waste characterization study. Source reduction and landfill projects require only gross waste volume from estimates. Recycling and waste-to-energy projects require accurate predictions of waste quantities and composition. |
| **Several methods for characterizing waste are available.** | *Modelling Techniques:* Modelling techniques use generic waste generation rates and other information. They are inexpensive but provide only a general idea of waste volumes and types. Three aspects of modelling techniques are described in this chapter: generic weight generation data, generation rates for recyclables, and landfill volume estimates.<br>*Physical Separation Techniques:* Physical techniques are more accurate than modeling techniques, but are also more expensive and time-consuming. Such techniques sample the community's waste stream to develop a waste profile. Three sampling techniques are discussed in this chapter: quartering, block, and grid.<br>*Direct Measurement Techniques:* If done correctly, pilot studies can provide accurate volume estimates. Some communities are also weighing and characterizing the actual waste stream as it is collected. Bar code monitoring is another technique that provides highly accurate estimates of recyclable materials; such systems, however, are costly. |
| **Estimating the amount of waste generation that can be prevented through source reduction or recycling** | It is unrealistic to assume that a community can completely prevent waste generation or recycle all the waste in its program. Even when waste characterization studies yield highly accurate information, some further estimate must be made of the actual percentage of material that the community can expect to collect. A variety of factors must be considered: |

| | |
|---|---|
| **is essential.** | ▪ Does your community have public or private collection?<br>▪ Does your community have businesses or industries that use private collection?<br>▪ Are there large numbers of residents who recycle on their own? Are there bottle deposit laws?<br>▪ Are there local ordinances (allowing residential burning, etc.) that may impact volumes? |
| **Estimating future waste generation is also crucial.** | Some waste management alternatives, such as waste-to-energy, rely on a steady supply of material over long periods of time, up to 20 years or more. The two most important trends to investigate are population and public policy changes. Legislatively mandated recycling and composting programs can reduce waste volumes significantly.<br>Caution is essential in sizing facilities—an oversized facility can bring economic disaster. Waste composition changes are also important. |
| **Consider the following factors when organizing a waste management program.** | Establishing a waste management program is a lengthy and complex process; the following considerations are crucial to long-term success.<br>▪ formulating and following a well-devised and comprehensive plan<br>▪ basing decisions on sound economic analysis<br>▪ keeping public participation rates high over a number of years requires an ongoing education and publicity plan<br>▪ acquiring and maintaining political support should be an ongoing effort<br>▪ many waste management projects take from five to ten years to implement. The ultimate key to success is the will to persevere—the thousands of successful programs underway nationwide attest to this. |

### 4.3.1. Production of SHW

Biblio [1]The cornerstone of successful planning for a waste management program is reliable information about the quantity and type of material being generated and how much of that material collection program managers can expect to prevent or capture. Without a good idea of the quantities that can be expected, decisions about equipment and space needs, facilities, markets, and personnel cannot be reliably made. This also identifies large weight and volume waste items to target for source reduction and recycling programs and gives baseline data for assessing whether goals were achieved.

Depending on the size of the program and the resources available to the community, there are a variety of waste characterization techniques that can be used. First, there are modelling techniques that apply generic waste generation rates and other community features to predict the waste quantities and types. These techniques are inexpensive and can provide a general idea of the quantities and types of waste expected for a program just starting up.

More accurate in describing the waste stream, but also more expensive and time consuming to implement, are the physical separation techniques. These techniques sample the community waste stream itself, using statistically significant sampling techniques to determine a community waste generation profile. Depending on community goals, both have a place in developing an effective waste management program. Some form of waste characterization estimate is crucial to program success, because later decisions will be based on this information.

The waste management option being considered will help determine the degree of detail needed from the waste characterization study. For a landfill project, only gross waste volume estimates are needed to help determine space needs. This is also true of estimating yard waste volumes for a windrow composting program. For these types of management strategies, generic and historically based waste generation rates may provide acceptable accuracy.

For other alternatives accurate predictions of waste volumes and composition are crucial to long-term program success. Accurate characterization will allow certain waste to be targeted for source reduction efforts. Many facets of a recycling program, including the size of a material recovery facility, the volume of recyclable material to be sold, and equipment and personnel requirements for collection are dependent on accurate characterization of the waste stream. For a waste-to-energy project, both sizing the facility

and calculating the quantity of energy that the facility will generate are based on characterizing waste volume and type. In the long term, the quantity of waste available for the facility will be affected by other options, including source reduction, recycling and composting. Inaccuracies in waste characterization studies for these alternatives can severely and negatively impact the economic viability of the program.

When determining which composition technique to use, the costs of gathering the necessary data should be compared with the limits of precision needed to make reliable estimates. Future community trends, such as population growth, must also be considered in developing a waste characterization profile.

The local authority has two sources of figures. If there's a SHW collection, it can get volumes collected or disposed at the local landfill. The second source is the norm of production per inhabitant according to the type of housing. Both are false. Even the application of the norm is senseless because nobody knows who really lives in each housing. By the contrary, we know that the real production is rather close 350 kg/inh/y.

So the first task is to develop a method and a programme for the knowledge of the real number of inhabitants of each housing.

Caution: the purpose is to organise the SHW collection, not to reconstitute the KGB.

Another method for our purpose should be to weight the collected waste street-by-street, or yard-by-yard.

In parallel, it must be described who pays the fee.

### 4.3.2. Forecasts

**Biblio 1** **Estimating future waste generation**

As alternatives for managing or preventing waste are investigated, it is important to make an attempt to accurately predict future trends in community waste generation. While this may be difficult, it is crucial to long-term program viability. Some alternatives, such as constructing a waste-to-energy facility, are financed based on a 20-year facility life. A drastic drop in waste delivered to a facility of this type could have severe economic consequences for the community that owns it.

The two most important trends that should be investigated are population and public policy changes. Population trends are usually monitored carefully. Some realistic prediction of the rate at which the community population is changing should be made.

Public policy shifts can quickly change the quantity and type of waste materials available to support a given option. For example, constructing a landfill or waste-to-energy facility without considering the possible impact of a trend toward legislatively mandated source reduction, recycling and composting programs could be risky. If there is great uncertainty, conservatism in sizing the facility is warranted. Facilities can usually be expanded. Oversizing a waste-to-energy facility, on the other hand, can be an economic disaster.

Changes in the composition of the waste stream should also be noted. Estimates developed by Franklin and Associates for the USEPA predict growth in plastics packaging and a decline in glass packaging between the years 1995 and 2010 (see Table 3-5). While generic estimates are difficult to apply locally, these predictions should be considered when planning the program.

Statewide waste composition projections can also assist future planning.

### 4.3.3. Mapping

As said in § 2.1.2 a key-phase of the diagnostic is to locate the data. It supposes to get a map of the relevant territory.

Within a general objective of modernisation of the municipal services, it should not have a lot of sense to do that on the draughtsman's table with paper and pencils, but why not if there's nothing else.

The modern technique calls to a GIS (Geographical Information System) in aim to develop a geodatabase. GIS supposes to use or to establish a basic layer of true coordinates: each point is defined by its geographical coordinates. So this map has no scale: a particular map may be produced at any scale. The fastest way is to take the points with a topographical GPS and to implement the collected data in a GIS software.

GIS software and GPS equipment are very expensive. Another way to start is to use AutoCAD that is easy to find on the market.

### 4.3.4. Publishing

The interest of reporting SHW production and fee payments on maps is:

- The problems are located but anonymous: it shows a street where 25% people don't pay but it's not written who doesn't pay;
- It's easier to show the problems on maps than on tables of figures, and to explain them to the inhabitants;
- It's easier to show on maps the progress from year to year.

## 4.4. Valuation of the problem and the solutions

### 4.4.1. Standard solution

The standard solution is to implement everywhere containers and to download them with the usual collection trucks that goes to the landfill.

It's easy to calculate the cost of this solution. When the production is located, the place and the number of containers can be determined, and then the number of rounds, and then the number of trucks and drivers, and so.

This solution is the baseline. It's easy to implement and it fulfils the 100% collected objective.

**Biblio 1** **Waste preparation and collection procedures should be coordinated.**

Decisions about how residents prepare waste for pickup and which methods are used to collect it affect each other and must be coordinated to achieve an efficient, effective system. Decisions about the following must be made:

- *Solid waste set-out requirements:* guidelines and ordinances specify how residents should prepare solid waste and recyclables for collection should be developed.
- *Point and frequency of collection*: how often to collect waste and from what points (curbside, backyard, etc.) must be decided.

**Collection equipment must be carefully chosen.**

Numerous types of collection vehicles and optional features are available. For specific equipment design information, contact equipment vendors and review existing equipment needs. Table 4-4 presents criteria for choosing the most appropriate equipment. Cost information and expected service life should be gathered and evaluated.

### 4.4.2. Variant: Transfer Station

For the moment the landfill is usually the municipal landfill at the door of the city. With the regional sanitary landfills, the distance between the city and the landfill will increase and it will take more time and it will consume more fuel for the collection trucks.

The impact of an increased trip to the regional sanitary landfill must be calculated.

The alternative is to implement a transfer station. Tacis proposes 2 schemes:

- Full transfer station within a building;
- Simplified transfer station made of a simple quay.

The transfer stations are associated to specific transfer carriages.

The local authority must calculate the cost of the use of a transfer station and the transfer carriages and must compare it to the cost of transfer by the collection trucks. If it's favourable, it must decide where to implement the transfer station(s).

**Biblio 1** **Is a transfer facility appropriate for your community?**

To determine if a transfer system is appropriate for your community, compare the costs and savings associated with the construction and operation of a transfer facility.

*Benefits:*

- lower collection costs
- reduced fuel and maintenance costs for collection vehicles
- increased flexibility in selecting disposal facilities
- the option to separate and recover recyclables or compostables at the transfer site
- the opportunity to shred or bale wastes before disposal.

*Possible drawbacks:*

- difficulty with siting and permitting, particularly in urban areas
- construction and operation costs may make them undesirable for some communities (especially for communities *less than* 10 or 15 miles from the disposal site).

**Consider these crucial factors when selecting a collection and transfer alternative.**

The following factors are usually important to public officials when evaluating collection and transfer alternatives:

- costs of required new equipment and ability of community to obtain financing for it
- costs to operate collection system and transfer facilities
- compatibility of total costs with budget available for solid waste services
- differences in levels of service provided by alternative systems
- ability of system to meet public's demands or expectations for service
- proposed methods for financing system costs and public acceptability of those methods
- the system's effects on efforts to meet the community's waste reduction and management goals
- compatibility of proposed roles for public and private sectors with political support for them
- public's interest or disinterest in changing present arrangements for collecting solid waste and recyclables.

**Developing efficient routes and schedules decreases costs.**

Detailed route configurations and collection schedules should be developed for the selected collection system. Efficient routing and rerouting of solid waste collection vehicles can decrease labor, equipment, and fuel costs.

**Implementing the collection and transfer system involves several steps.**

Implementing a collection and transfer system involves the following activities:

- finalizing and modifying the system management plan
- purchasing and managing collection and transfer equipment
- hiring and training personnel
- developing and managing contracts with labor unions and private collection companies
- providing information to the public
- constructing and operating transfer, administrative, and maintenance facilities.

### 4.4.3. Variant: Selective Collection

The SHW contains a part of recyclables. Tacis made in 2003 an assessment of the rate of recyclables but these figures are: 1/ only an assessment; 2/ not up-to-date; 3/ not representative of any particular city.

A large part of these recyclables are already picked-up in the containers by ragmen. For PET and glass, >50% are so collected before the passage of the collection truck.

The implementation of a selective collection is the best way to sensitise the population to its behaviour toward environment.

Recyclables must be sorted before to be sold to recycling facilities.

The city must study what is the share of recyclables in the produced waste (what inhabitants put in the container) and in the collected waste (what the truck downloads on the landfill).

The city must find and negotiate and contract the issues of recyclables: the minimum is 1 buyer per material. The investment is high and must be secure by long-term contracts.

The city must define the implementation of a selective collection (where to put the containers, and how many).

The city must draw a business plan: investment, operation costs, additional incomes = sales of recyclables + reduction of the collection costs of rough waste (diminution of the collected tonnage).

**Biblio 1** **Program design and revision are ongoing efforts.**

Establishing an effective recycling program presents major administrative and political challenges to a community. In successful programs, procedures are continually reviewed and adjusted according to evolving conditions and changing community needs.

**Design programs as coherent systems that involve the public in every step.**

An efficient recycling program requires a systems approach—all program components are interrelated; decisions about one must be made with other components in mind. Successful recycling also requires enthusiastic public participation, and programs must be designed with public convenience and support in mind.

**This 12-component plan provides an outline for successful program design.**

Following a sequential approach can ensure adequate planning and successful program implementation.

1. Identify goals.
2. Characterize recyclable volume and accessibility.
3. Assess and generate political support.
4. Assess markets and market development strategies for recyclables.
5. Assess and choose technologies for collection and processing.
6. Develop budget and organization plan.
7. Address legal and siting issues.
8. Develop start-up approach.
9. Implement education and publicity program.
10. Commence program operation.
11. Supervise ongoing program and continue publicity/education.
12. Review and adjust program.

**Successful marketing of recyclables requires**

**• accurate market knowledge**

**• shared decision making.**

Securing stable, reliable markets requires (1) basing marketing decisions on a clear understanding of the recyclables market system, and (2) sharing decision making among recycling program planners, government officials, the public, and the private sector. Assessing markets involves the following:

- *Identifying buyers:* Names, phone numbers and addresses are available from state recycling offices (many produce recycling markets directories).
- *Contacting buyers:* Ask about the price they will pay, specifications for how the materials must be prepared, and amount of contamination that is acceptable.

- *Selecting buyers:* The buyer's abilities must closely match the recycling program's needs. Some program planners interview prospective buyers.
- *Contracting with buyers:* A written contract specifying what is expected of all parties should be made. During market downturns some buyers will only service customers who have contracts.

### 4.4.4. Variant: Domestic Composting

Mainly in the private sector the inhabitants have a garden at home. This private sector is usually characterized by roads and streets in a very poor state, making difficult the access of a collection truck (moreover during winter), and a low rate of contracts and payment of the fees. The counterpart is the generation of wild dumpsites that the city has to clean away once or twice a year.

In EU the domestic composting is hardly promoted, and successfully, as a cheap solution for reduction of the waste to be collected and disposed, and a healthy way to dispose a large part of the SHW.

Some questions must be decided:

- What is the share of the purchase of the composters that the city will pay?
- How to organise the public awareness, then the training of the volunteers?
- How to collect the remaining waste?
- Which policy of tariff for the volunteers?

At least, the implementation of domestic composting is a particular business plan.

**Biblio [1] Composting is an environmentally sound recycling method.**

Composting involves the aerobic biological decomposition of organic materials to produce a stable humus-like product. Compost feedstock should be viewed as a usable product, *not* as waste requiring disposal. Program planners should stress that the composting process is an environmentally sound and beneficial means of recycling organic materials, *not* a means of waste disposal.

**Composting can significantly reduce waste stream volume.**

Up to 70 percent of the MSW waste stream is organic material. Yard trimmings alone constitute 20 percent of MSW. Composting organic materials can significantly reduce waste stream volume and offers economic advantages for communities when the costs of other options are high.

**Developing and operating successful composting programs presents several challenges.**

These challenges include the following:

- developing markets and new end uses
- inadequate or no existing standards for finished composts
- inadequate design data for composting facilities
- lack of experienced designers, vendors, and technical staff available to many municipalities
- potential problems with odours
- problems controlling contaminants
- inadequate understanding of the biology and mathematics of composting.

**Source reduction tops USEPA's composting methods hierarchy.**

Communities and individuals are encouraged to follow the hierarchy as listed below in order of preference: Grasscycling and home backyard composting completely divert materials from the MSW stream and should be adopted whenever possible.

Source-separated programs offer several advantages over mixed MSW programs, including: reduced handling time, less tipping space, and less pre-processing equipment. Mixed MSW composting offers fewer advantages over the long term.

1. Grasscycling (source reduction)

2. Backyard composting (source reduction)

3. Yard trimmings programs (recycling)

4. Source-separated organics composting (recycling)

5. MSW composting programs (recycling)

**Planning a composting program involves these steps.**

1. Identify goals of the composting project.

2. Identify the scope of the project—backyard, yard trimmings, source-separated, mixed MSW, or a combination.

3. Get political support for changing the community's waste management approach.

4. Identify potential sites and environmental factors.

5. Identify potential compost uses and markets.

6. Initiate public information programs.

7. Inventory materials available for composting.

8. Visit successful compost programs.

9. Evaluate alternative composting and associated collection techniques.

10. Finalize arrangements for compost use.

11. Obtain necessary governmental approvals.

12. Prepare final budget and arrange financing.

13. Construct composting facilities and purchase collection equipment, if needed.

14. Initiate composting operation and monitor results.

**Backyard composting programs can significantly reduce the volume of MSW.**

In some communities, 30 or more percent of the MSW generated during the growing season is yard trimmings. Grasscycling and backyard composting programs reduce the need for collecting, processing, and disposing of the composted materials. Yard trimmings can be composted in piles or containers located in yards. Effective education and appropriate incentives are necessary to successfully implement communitywide backyard composting programs.

### 4.4.5. Variant: Green Waste Collection and Composting

Municipal services and ZHEKs generate a lot of green waste: lawn cutting, autumn leaves, pricking out of flowers, pruning. Either they are burnt, either they are disposed on the municipal landfill.

These green waste may be valued by composting. This technique is easy to implement with a flat hard ground (ideally waterproof) and usual equipments (tractor, etc.) with the exception of a grinder. It exist a large range of these grinders depending the quantities of waste to grind.

The produced compost can be used by the services and/or sold to the inhabitants.

It must be calculated the quantity of such waste and the cost per tonne of composting. In parallel, it can procure a reduction of the transportation (to the composting plat-form and not to the landfill) and an economy of disposal costs.

**Biblio 1** **Final compost use and markets are crucial for program planning.**

A well-planned marketing approach ensures that all compost will be distributed. Accomplishing this requires producing a consistently high-quality compost to satisfy market needs. The quality and composition required for a compost product to meet the needs of a specific market depend on a mix of factors, including intended use of the product, local climatic conditions, and even social and cultural factors.

**Several states are considering regulating composts.**

One approach for establishing regulations is to rely on the federal standards for land application of biosolids. Metals content of the applied material is an important concern. Table 7-2 shows the maximum metals content for land application of biosolids.

**Consider marketing to large-scale compost users.**

Large-scale users of composts include the following:

- farms
- landscape contractors
- highway departments
- sports facilities
- parks
- golf courses
- office parks
- home builders
- cemeteries
- nurseries
- growers of greenhouse crops
- manufacturers of topsoil.

**The quality of a compost product directly impacts its marketability.**

Quality is judged primarily on particle size, pH, soluble salts, stability, and the presence of undesirable components such as weed seeds, heavy metals, phytotoxic compounds, and undesirable materials, such as plastic and glass. (Table 7-4 summarizes compost quality guidelines based on end use.) The marketability of a compost can be controlled by selectively accepting feedstock materials. Feedstock material should be carefully controlled to ensure consistent compost quality.

### 4.4.6. And so…

All ideas can be examined but they must be valuated and compared to the cost of standard collection + sanitary landfilling.

## 4.5. Negotiation of the means

All these actions are possible but they require equipments and personnel.

### 4.5.1. Fees and tariffs

The condition of a sustainable development is to target a self-sufficient functioning of the SHWM. The fees must cover the costs and the costs include the amortization of the investments.

The local authority must define concrete objectives of evolution of the tariffs and of recovery of the fees. For the moment, it supposes also to establish individual contracts in the private sector.

### 4.5.2. Subventions

The final objective is a self-funding of the investments (eventually help to loans). But it's necessary to start a virtuous spiral: the first investments must generate incomes but these first investment cannot be funded out of State subventions, or grants.

The improvement of the SHWM is a willing of the Regional Administration. It plays a key-role in the process of yearly negotiation of the State Subventions (Municipal Fund and Ekofund). The Regional Administration must engage to help the local authorities all along the duration of the LAP.

**Biblio 1** **Explore alternative funding methods to determine which is appropriate.**

Explore alternative mechanisms for funding collection services. The two most common funding methods are property taxes and special solid waste service fees. However, communities are turning more to user-

based fees, which can stimulate waste reduction efforts and reduce tax burdens. Economic incentives can be used to reduce waste generation by charging according to the amount of waste set out. When selecting a funding method, considering waste reduction and management goals is important. Table 4-2 lists advantages/disadvantages of alternative funding mechanisms.

### 4.5.3. Privatisation

When problems are unsolved, it's a common temptation to think that the private sector will solve them. But usually businessmen are not crazy and a private company will not manage a non-profitable situation. We have seen several tries of private collection that ended quickly.

Usually, the private sector is more efficient for high tech: the development and maintenance of competencies and skills is easier for a company managing 100 municipalities than for each municipality. It's applicable to recycling and disposal. But the waste collection is not "high tech".

Private companies can have their own means for the investment although it's difficult for the municipality to contract credits. But usually, the tariff applied to the inhabitants by a private company is largely higher than the cost of a credit.

**Biblio [1] Both public and private operation should be considered and evaluated.**

The municipality should determine appropriate roles for the public and private sectors. The collection system may be operated by (1) a municipal department, (2) a contracted private firm or firms, or (3) a combination of public and private haulers. Regardless of the management options chosen, a clear organizational structure and management plan should be developed.

### 4.5.4. Public awareness and behaviour of inhabitants

It's a key-mean. The efficiency of the system greatly lies on the behaviour of the producer of the SHW who is the inhabitant.

Biblio [1] Developing integrated solutions for waste management problems requires public involvement. To economically and efficiently operate a waste management program requires significant cooperation from generators, regardless of the strategies chosen—buying products in bulk, separating recyclables from non-recyclables, dropping off yard trimmings at a compost site, removing batteries from materials sent to a waste-to-energy facility, or using designated containers for collecting materials. To maintain long-term program support, the public needs to know clearly what behaviours are desired and why.

Biblio [1] Involving people in the hows and whys of waste management requires a significant educational effort by the community. Ineffective or half-hearted education programs may confuse the public, reduce public confidence, or elicit hostility toward the program. Successful education programs must be consistent and ongoing.

Biblio [1] Public education stimulates interest in how waste management decisions are made. And, when citizens become interested in their community's waste management programs, they frequently demand to be involved in the decision-making process. Communities should anticipate such interest and develop procedures for involving the public. When the public is involved in program design, it helps ensure that programs run smoothly.

| | |
|---|---|
| **Public education and involvement are crucial.** | A successful waste management program requires wide-spread public participation. Such participation can best be obtained through early and effective public education programs, which must continue even after the program is in full swing. |
| **Planning and research form the basis for successful education.** | Communities comprise different mixes of home owners, apartment dwellers, business people, students (from college-level to preschool), age groups, income levels, and cultures. Planners must first know their own communities well enough to de-sign programs that meet their specific needs. |
| **An effective education program leads people through several stages.** | The six stages of a successful education program include the following:<br>1. Awareness: At this stage, people are learning about something new. The goal is to let people know that a different way of handling waste may be preferable. Table 1-1 lists low-cost, medium-cost, and high-cost education methods. |

| | |
|---|---|
| | 2. Interest: After people have been made aware of waste management issues, they seek more information. Program planners must use a variety of methods to inform people. Voluntary programs require strong emphasis on promotion; mandatory programs should make clear what is required.<br><br>3. Evaluation: At this stage, individuals decide whether to participate or not. For even well-promoted programs, initial participation is about 50%. Making program requirements clear and easy to comply with increases participation.<br><br>4. Trial: Individuals try the program at this stage. If they encounter difficulty, they may opt not to continue participating. Well-publicized hot lines and clearinghouses provide additional instruction and information.<br><br>5. Adoption: Participation should continue to grow. Ongoing education programs solicit constructive feedback and provide new program information when necessary.<br><br>6. Maintenance: Ongoing incentives and education keep participation rates high. |
| **Following this eight-stage plan facilitates public involvement.** | Effective waste management is a continuing process of public education, discussion, implementation and evaluation. All options should be continually investigated and actively debated, moving the community toward a consensus on the proper mix of source reduction and waste management programs.<br><br>1. Concern: Waste management is put on the public agenda.<br><br>2. Involvement: Representatives of various interest groups (regulatory officials, individuals from neighboring communities, local waste management experts, representatives from environmental and business groups) are encouraged to participate.<br><br>3. Issue Resolution: Interest groups make their points of agreement and disagreement clear to each other and to program planners.<br><br>4. Alternatives: Groups should make a list of available alternatives, including “no action.”<br><br>5. Consequences: Economic and environmental consequences of each alternative are discussed.<br><br>6. Choice: Alternatives are decided upon.<br><br>7. Implementation: The steps necessary to carry out the program are described and potential adverse impacts are mitigated, if possible.<br><br>8. Evaluation: The community should continually evaluate the program and solicit input. |

**Maintaining good public communication is crucial.**

Maintaining good communications with the public is important to a well-run collection system. Residents can greatly affect the performance of the collection system by cooperating with set-out (how waste is presented for collection) and separation requirements, and by keeping undesirable materials, such as used oil, from entering the collected waste stream.

Biblio 2LEAPs require a close working relationship between citizens and local officials. Local officials hold the key to implementing environmental programs — from financing capital investments to adopting local ordinances.

Overwhelmed with a wide range of environmental problems that need immediate attention, some local officials are collaborating with citizens to help address these problems. This collaborative approach can only be successful if it is built upon a foundation of common purpose and trust between local governments and citizens.

## 4.6. Selection of actions

### 4.6.1. Cost/Benefit approach

Each action must be assessed in terms of cost and benefit. It's the main condition of feasibility.

### 4.6.2. Monitoring and feedback

Each action must include a system of monitoring aiming at checking and measuring the results.

This monitoring provides a feedback and a procedure of correction of the action must be defined.

Biblio 1 **Successful management requires monitoring the system's costs and performance.**

Collection and transfer facilities should develop and maintain an effective system for cost and performance monitoring. Just as the goals of a collection program guide its overall directions, a monitoring system provides the short-term feedback necessary to identify the course corrections needed to achieve those goals.

### 4.6.3. Final selection

The possible actions must be classified as they are more or less easy to implement, and more or less efficient for the final objective of SHWM.

## 4.7. Programme of action

The programme of action is defined with the services. They must be convinced because it's them who will implement the actions. They must be motivated.

They will need resources for that: time, even additional personnel, equipments, etc. It must be organised. The availability of these resources is a normal bottleneck and it limits the capacity to launch, to implement, to follow-up, the actions. The common rule is to do "one by one" and not to launch everything at the same time.

Biblio 1 **Good personnel management is crucial.**

As in all organizations, good personnel management is essential to an efficient, high quality waste collection system; hiring and keeping well-qualified personnel is crucial. Because collection jobs are physically demanding, carefully assess each applicant’s physical condition. To retain employees, management should provide a safe working environment that emphasizes career advancement, participatory problem solving, and worker incentives.

**Safety is a crucial concern.**

Safety is especially important because waste collection employees encounter many hazards during each workday. As a result of poor safety records, insurance costs for many collection services are high. Frequently encountered hazards include:

- busy roads and heavy traffic
- rough- and sharp-edged containers that can cause cuts and infections
- exposure to injury from powerful loading machinery
- heavy containers that can cause back injuries
- household hazardous wastes such as herbicides, pesticides, solvents, fuels, batteries, and swimming pool chemicals.

# 5. Bibliography

Biblio 1 Decision-Makers' Guide To Solid Waste Management, U.S. Environmental Protection Agency, 1995

Biblio 2 Guide to implementing local environmental action programs, Regional Environmental Center for Central and Eastern Europe, 2000

Biblio 3 Workbook Methodology for a "Local Environmental Action Plan" (LEAP), Environmental Protection Agency from Schiedam - DCMR and Consultants/IWACO - Environmental Protection Agency from Bacau, 1999