Development of a Strategy to Harmonise State and Regional Waste Treatment Legal Basis with the EU Standards

Final Report

Methodology for Strategic Planning of Industrial Waste Management

19 October 2004

Acronyms

DENR	Department of Ecology and Natural Resources (State) - Ministry of Eco-resources of Ukraine
DCHS	Department of Housing and Communal Services
EBRD	European Bank for Reconstruction and Development
ED	European Delegation in Kiev
EU	European Union
IFIs	International Finance Institutions
IPPC	Integrated Pollution Prevention and Control
JEK	Local Housing Administration
NGO	Non-Governmental Organisation
NIMBY	“Not In My Back-Yard”
NIMEY	“Not In My Election Year”
PPP	Public Private Partnership
PWO	Permanent Waste Observatory
RSA	Regional State Administration
SES	Sanitary and Epidemiological Service
SHW	Solid Household Waste
SHWM	Solid Household Waste Management
SIW	Solid Industrial Waste
SME	Small and Medium (size) Enterprises
SIWM	Solid Industrial Waste Management
ST	Study Tour
TACIS	Technical Assistance to Commonwealth of Independent States (Programme of Assistance of the EU to NIS and Mongolia)
TIWG	Total Index of Waste Generation
TOR	Terms Of Reference
UAH	Ukrainian (UA) Gryvna (H), official currency unit
WB	World Bank

Table of Content

1 Summary

The report is organized according to the following parts:

General Principles: this part describes the principles progressively well fitted in the Western countries for the strategic planning of the waste management. It concerns the objectives, the methodology, the content of a Plan, the dialog process, the Commission of the Plan.

Steps of the institutional programme: this part reviews the organization of the job and the tasks for the preparation of the Plan.

Steps of the technical programme: this part describes the tasks for the content of the Plan.

Recommendations: this part lists some laws and regulations missing or needing to be updated for the SIW management.

The programme was largely undersized regarding its objectives. Fortunately the report could benefit of the works of the Tacis Programme: Improvement of the Solid Household Waste Management in Donetsk Oblast whose the main issue has been the Regional SHWM Strategic Plan. Some other tasks of this programme have been useful as the audit of the Inspection of the Environment and the inventory of the landfills.

It appears now that some long tasks need an effort and a technical assistance, both for the harmonisation of the legal basis with the European and international standards, and for the concrete implementation of the reforms on the field.

2 General Principles

2.1 Introduction

The amelioration of the solid industrial waste management (SIWM) in the administrative regions of Ukraine, which is essential for sanitary and environmental reasons, requires the elaboration of a multi-year plan. The plan itself shall rests on a fine analysis of the actual conditions of SIWM in the oblasts[1]; it shall fix some reasonable goals that can be achieved during this multi-year (long-term) period; it shall describe the financial, practical and organisational means necessary to that goals. It shall also deal with the urgent measures that are necessary during the period of its own achievement, arbitrate between all the needs that will be expressed during its elaboration and define specific and general actions that will be useful to an immediate improvement of the situation: in this sense, the plan shall be at the same time a SIWM plan and a SIWM *improving* plan.

The objective of the TACIS Programme: Development of a Strategy to Harmonise State and Regional Waste Treatment Legal Basis with the EU Standards, as indicated in the contract, is to improve the capacity of management of the industrial waste. This objective supposes that practical solutions are proposed to the producers of waste, but also that the conventional mechanisms of political and administrative regulation in this region integrate this plan as a solid reference. This is the only way to ensure that the plan will really be, at least partly, effective.

2.2 General Objectives

Everywhere in the World, the waste management belongs to the social contract. To live together puts immediately the principle of the settlement of social rules in aim to put the waste of the community in a place far off the housing areas. The societies went sophisticated along time and evolution, but the waste management stays always entrusted to the community or its expressions as the city, the region, the state. With the development of our scientific knowledge about this subject appeared the notions of industrial waste, special waste, hazardous waste and others, whose the management is often relevant of higher authorities.

Means

Nothing can be done without means. If it's wanted to collect and to dispose all the waste, it supposes that the services in charge exist and have the means. And this service must be paid. It's the first fundamental.

Landfills

It exists a lot of regulations about landfills, whether international or national in industrialized countries, based upon a level of technique, and even as we have the means, the best available technologies. But everybody has not such means. The concrete objective is to forbid the contamination of the water resource by the waste and their decomposition (organic) or their reactions (chemical). On this objective, the inventory of the local means and of a reasonable financing effort, allows to define the game rules: the minimal criteria to impose in aim the landfills show off a satisfactory degree of safety to protect the resource at economical conditions affordable for the community.

With these criteria, it's then possible to locate the future landfills. On one hand, it will be found a little number of convenient sites, on the other hand, it's easier to well manage one landfill between 100 000 and 200 000 tons/year than a lot of landfills of 10 000 tons/year. So it must lead to a regional plan of creation of safe or sanitary landfills.

The second fundamental is so to cover the whole territory with a park of landfills allowing to insulate the totality of the waste from the environment. For a progressive setting on, it will be useful to rationally

1 We don't ignore that according to the Constitution of Ukraine, the regional bodies are the oblasts, the cities of Kiev and of Sevastopol, and the Autonomous Republic of Crimea. For the simplicity of the report, we'll use "oblasts" to resume all these bodies.

characterize the existing landfills which can be kept for some time without significant attempt to the environment.

Police

Nobody desires to pay for the protection of environment. Once given the means to control the source of the waste and their destination, all the operations of the chain must be controlled. It's the role of the public power and it's a power of police. To do that, it must be disposed liable measure instruments (laboratories, generalization of the weighting of the waste). The administration must dispose of enough means in people, computers, vehicles. All that must be regulated with a penalties system and that penalties must be applied.

The third fundamental is so to create or to restore a true administration of the environment and all the necessary annex components.

Strategic Planning

All that cannot be done within several days by some decrees. The local authorities must be able to manage their own situation. But the exercise becomes complex from the fact of the necessity to manage simultaneously the transition. The permanent question must be: what can we do with what we have ? It can only be pre-supposed an economical recovery, if not an economical growth. After having put at level the three fundamentals, and it's already an economical effort, to reach the "advanced" regulations and practices can only be progressive. So it's indispensable to create a structure of consultation and of management of this evolution. It's willed that environment and waste management should be a true priority but nothing can be imagined beyond the available means. A Plan and a structure of Plan are required. A Plan is required to take cohesive decisions all over several years, paying attention they should be harmonized between economics, regulations, control administrations. A structure of Plan is required to prepare these decisions with a deputation of the elected and the administration, as of the civil society, to update the waste data, to control the good execution of the Plan.

A transverse principle of all these strategic considerations is and must stay impregnating: the one of coherence and synchronization. A waste management includes multiple components. We spoke of regulation, of police of environment, of laboratories, of waste treatment facilities, of financing means, of administration. We can add the standards of sampling and analysis, the sensitisation of the people and of the elected, the training of the elected and of the officials, and so many things more. It's dangerous to progress one of the components on a given subject without to check that all the other components stay coherent with this advance. It's an essential dimension of the Plan: to take decisions but watching they are always synchronous and coherent.

To summarize our purpose, each time it's considered to improve the waste management, we must have the modesty to fix as first objective to control the stream of waste. For that, three operational conditions, which are quite intermediary objectives, are to get the technical and financial means to collect the whole waste, to get the capacities of "safe" storage of the whole waste, to get a set of coherent and efficient institutions to control the stream of waste.

2.3 Methodology

2.3.1 General methodology for public planning projects

As a project, the plan will necessarily have to be *situated*, in the sense where it will have to fit with the administrative, geographical, sociological, economical, environmental, cultural, etc., particularities of the territory on which it will be implemented.

It will also have to be elaborated in a *deliberative* way, in the sense where not only the goals of the plan and the means used to achieve these goals, but also the process of the elaboration of the plan and the means of monitoring of its realisation should be the objects of a sincere deliberation between all the concerned persons and bodies. By this way, the dialog process itself will be understood by every bodies participating to it: they will thus be able to understand exactly at which level of authority each meeting takes place. The aim is also to build collectively a process that will fit with the habits and particular preoccupations of everybody. A

deliberative process (instead of a totally pre-built procedure) puts everybody in face of its responsibility, and defuses every criticism on the process itself by advance.

The goal of this totally opened deliberation is to ensure that the plan will be really understood and appropriated by the administration and the authorities who will have to make this plan effective and credible with the eyes of the population. We know indeed that an active and volunteer participation is necessary to the quality and relevance of the result of this kind of project.

Thus not only the plan itself, but also the process of its elaboration, its implementation and its realisation will have to rest on a dialog process.

2.3.1.1 Organisation of a multilateral public dialog

This dialog process cannot be limited to a series of bilateral meetings between the responsible body and the others concerned bodies. In this case, there would be a risk that the process turns to only a series of *hearings*, with a responsible body making arbitrations, and it appeared in European Union that it is far more profitable to organise a multilateral dialog between all the concerned organisations. The frame of this multilateral dialog could take place in what could be called the "Commission of the Plan", since the notion of commission is well associated with the idea of deliberation and is easy to translate in many languages.

2.3.1.2 Risks due to institutional specificities

One major issue is that such a public multilateral dialog, that has become a traditional way of taking decisions in Western Europe (or at least offers possibilities of expression for every social bodies), is not usual in this region. Several interviews with elected authorities or administrative executives confirmed that the vertical way of management that was used in USSR is far from being disappeared. Beyond legislative imprecision and contradictions about local self-governments in regard of the vertically organised State administration, the social conventions still give an enormous importance to this administration. Thus, the chairman of the regional State administration (the Governor), who is designed by the President of Ukraine, is clearly the most influent individual in the region, and the State administration remains of a determinant influence in any public domain.

2.3.1.3 Content of the plan

The TACIS Programme will not decide the content of the plan, but the TACIS experts will do clear propositions that should help the local deciders to take the most appropriate decisions. The experiment of waste management planning that was accumulated in European Union gives a rather clear idea of what should be the content of a long-term SIWM plan.

The Commission of the Plan will have to debate about this content.

Proposition of content

The plan shall include:

- a description of the actual situation, as precise as possible:
  - SIWM legal aspects;
  - existing waste related plans or cleaning and waste management programs;
  - SIW production assessment, as precisely as possible;
  - SIWM actual system, including not only municipal firms, but also the private and informal sector (metal and paper recycling networks, scavengers…);
  - assessment of the "passportized", official and illegal dumpsites, and of the zones where burning waste is a common usage;
  - environmental, sanitary and economical impact of the actual system of SIWM;

- the establishment of common global "political" directions, with a hierarchy in the problems and in the ways of treatment;
- a program for the reduction of waste production:
  - information and education program for the employees of the companies;
  - eventually, local regulatory solutions;
  - direct action on administrations and the firms on which administration or elected authorities have an influence (environmental management);
- a forecast in the middle-term and long-term:
  - forecast of the type and quantity of production of the industries according to economical ant social tendencies;
  - forecast of the treatment capacities that would be necessary;
  - approximation of the cost of a better SIWM system, in relation with the possible growth of taxes (or individual costs of a private system), the necessary investments, the possibility that private investors or foreign financial institution should participate to the realisation of the plan…;
- the definition of middle-term and long-term economically and technically realistic practical objectives, including public and private investments:
  - end of illegal dumpsites;
  - promotion of "good habits" in the whole economy;
  - opening of new sanitary landfills;
  - individual and common equipment (containers);
  - transport management ;
  - re-use, recycling, composting, "technical" incineration…;
  - actual synoptic *versus* forecast "ideal" synoptic;
- the definition of some middle-term precise projects:
  - experimental projects already started up;
  - new projects (which could be the opening of a first new sanitary landfill complying with the European technical standards);
- the definition of short-term actions:
  - in order to move towards compliance with the existing law;
  - in order to solve, even provisionally, the most urgent environmental and sanitary problems;
  - realising immediately some eventually possible low-cost improvements (by local politic or administrative decisions).

This list is of course not exhaustive, and shall be modified during the dialog process. The contents of the plan should be on the agenda of the first meetings of the Commission, which shall nevertheless work on the basis of a proposition that would have been elaborated by the TACIS experts.

2.3.1.4 Evolution of the plan

Beyond the content of the plan that will be approved, the plan must be seen as an evolutionary document that shall adapt to the inevitable differences that will be observed between the forecasts and the reality and to the delays that could happen, or to some eventual changes in the economical frame, in the laws, in the conventional habits, and so on.

For that reason, the dialog process shall continue after the official adoption of the plan, and the Commission thus shall not disappear, but get the charge of the monitoring of the realisation of the plan and of its evolution.

2.3.2 Organisation of the Plan

2.3.2.1 The leadership over the project

Two bodies could reclaim the leadership of the dialog process: the Regional Council (*Oblast Soviet*), which gathers elected authorities who are representative of the population of the oblast, and the national administration in the oblast, which undoubtedly has the best technicians and the more influence on the oblast.

In a decentralised country, the elected authorities would have taken the responsibility of the dialog process, but, in a concern of adequacy with the reality of Ukraine, it seems relevant not to hide that the administration lead by the Governor is the key actor in this process. In comparison, it must be considered that in France, for example, the SIWM plans were often lead by the prefects (equivalent to the governors). It would be possible that the Governor (or his representative) becomes the chairman of the Commission of the plan.

Furthermore, the Department of Environment should also be closely associated to the preparation of the process and to the dialog itself, since it is practically the DOE that has the most technical competences and shall practically apply the plan.

2.3.2.2 The status of the Commission of the plan

The administrative solution

The Commission could consist only in the sum of multilateral meetings organised by an administrative body. In this case, the administration would keep a total control of all the technical aspects of the organisation of the dialog and of the general public information, and we can fear that the process of dialog would thus not fit with the objectives of an opened deliberation that are described in §3.2.4. After having interviewed several deputies and administrative executives, it seems indeed that this kind of opened multilateral deliberation constitute a real institutional innovation. It is what has been done in Donetsk Oblast for the Regional Strategic Plan of Solid Household Waste Management. The Commission has been entitled Working Group.

The Regional Council solution

The Commission could take place in the frame of the Regional Council. In this case, the Council could officially create the Commission and make a place in it for the administration's representatives, or even let them the presidency of the Commission. But we can seriously doubt that the Regional Council would accept such a responsibility and such a new amount of work without a pressure from the administration or from the population. Furthermore, the Regional Council deputies do not have any experience of such a dialog process.

The Commission as an autonomous organisation

The Commission could be itself an organisation. The status of non profit association could then be well adapted to the aim of the Commission. This status would have many advantages:

- The Commission of the plan of SIWM would be a moral person.
- Possibility to directly engage independent people, to make purchases, to get money or goods from almost any other organisation (elected councils, administrations, TACIS Programme, other associations, individuals, international donors…).
- The statutes of the association can be adapted to the issues it will meet (problems of weighting of the votes, admission of new members, replacement of individuals representing their organisation…).
- An association is a "neutral" place. Even with a large representation of the administration, the frame of an association will allow a far more democratic and authentic dialog than any administrative frame.

- The adhesion to an association (NGO) whose aim is to deliberate does not represent a transfer of competence, neither for the administration bodies, nor for the elected councils.
- Possibility to create an executive committee of the association, which could gather the most volunteer people for the practical management of the association.

This association could be called "Association of the Commission of the regional plan of SIWM of the region of …" or "Association for the Commission of the Plan".

2.3.2.3 The secretariat of the Commission

The role of the Commission

During the elaboration of the plan, some studies and expertise missions will certainly be necessary. This means much work for the calls to tenders, for the elaboration of terms of references…

Furthermore, the Commission will have to organise the dialog and many hearings outside of the frame of formal meetings: for example, it will certainly be necessary to organise meetings the Chamber of Commerce and the Professional Unions, to prepare documents, to command the edition of advertisement-like booklets for the awareness of the enterprises or for some targeted publics, and so on…

The secretariat

The Commission will thus need some working capacities: its secretariat. Nevertheless, its activity will be much more important during the period of debate, of elaboration of the plan and immediately after the inception of it, than for the future monitoring of its realisation, except in case of punctual big realisations. In that sense, the association should try to function with a maximum of subcontractors, in order to avoid to generate too many short-term contracts and to finally remain with a too large equipment (offices, computers…).

The TACIS Programme could certainly be helpful to the inception of the secretariat and to its work, by furnishing technical assistance or ready-made statistical studies, studies on waste production, waste management, forecast methodology, technologies assessment… In this sense, the TACIS Programme will contribute to chop the peak of activity before the inception of the plan. But the secretariat will need, for example, at least one or two operational executives who will have to quickly get a general view over all the issues of the planning process.

The secretariat of the association will also need the help of the regional administration (technical assistance), of the Regional Council (technical assistance, cooperation) and of city councils (animation, advertising in municipal newspapers).

Functioning of the commission

According to the decisions taken during the latest meeting, the secretariat will prepare each meeting of the Commission. This includes the convocation of the members, the practical organisation and the elaboration of the working documents. In order to prepare these documents, the secretariat will need to subcontract studies to different consultants.

2.3.2.4 The planning process

Sizing of the commission

The number of people who participate to the meetings of the commission is an important issue: if too little, it will reveal a lack of dialog; if too important, it will be a source of heaviness and will make the debate transform into a kind of spectacle, where only the most influent and self-sure people will dare speaking. The number of participants should thus be comprised between a minimum of fifteen and a maximum of thirty people.

Composition of the commission

The weighting of the represented bodies should be equilibrated between political an technical preoccupations, between the necessary authority that must get this plan and the democratic and deliberative process that *must* lead to it, and between the environmental and sanitary considerations that lead to the inception of this TACIS Programme and the necessary financial pragmatism that will allow a real improvement in SIWM despite a difficult economic context…

A first assessment of the bodies that shall be represented in the Commission of the plan would be:

- the regional State administration
- the regional directorate of the ministry of environment
- the regional sanitary and epidemiological service
- the regional council
- some of the most important companies directly
- the companies as a whole, by the way of the professional unions
- the environmental associations
- the Chamber of Commerce and Industry
- the scientific community
- the TACIS Programme team (as individuals among the most qualified experts in the region) throughout project
- …

Some bodies may have more than one representative, in order to reflect their particular importance or to represent their different internal tendencies or point of views. Whenever it would be necessary to have more than about thirty individuals in the association, it would be then necessary to create a "effectively-working" core that would be able to meet and to debate more conveniently: this kind of problem should be solved before the redaction of the statutes.

The inception of the Commission

In order to get immediately a certain credibility, the Commission should be created by the regional State administration.

Financing of the Commission

The way the Commission could be financed must be clarified: some members will need to be paid to come to the meetings (this is true in the case of financially weak bodies that will not get direct benefits in the implementation of a SIWM plan), whereas other members will clearly have to contribute to the financing of the association, to a technical assistance or to direct practical help (administrations, unions, …).

The solution will certainly be to negotiate the conditions of the participation of each one, or even of the individuals representing those bodies.

2.3.3 Planning Issues: Assessment of the Present Situation

2.3.3.1 Principles

Existing practice

The current practice in Ukrainian administration for the long-term programs is to list the investment projects that each city needs in the future years. This list is then aggregated at the regional level after checking by

the regional administration that technical-economic studies have been carried out. In few cases administration endeavours to merge some facilities in order to rationalise obvious cases (neighbouring towns). Each city mentions the cost of the investment, and the share that could be taken by the local city budget. Then the Regional administration adds its own financial contribution. The surplus is then attributed to "other investors". The result is that the programme has two main particularities:

- The program is too large, because not studied as a system. The number of facilities exceeds the technical necessities and the means of the region. In the Donetsk Oblast 2000-2005 program, 39 polygons should be built or renovated, for a capacity exceeding the total amount of solid waste produced in the region and a total investment of 120 millions UAH (25 UAH per inhabitant). When the other existing polygons are added, the total capacity is the double than needed. It is obvious that the present system multiplies doubled and useless facilities, which cannot be built.
- The program is not based on carefully designed forecasts: change in waste composition due to the life of the enterprises (new productions, new processes, stopped productions) are not taken into consideration.

No political decisions included in the law on waste are explicitly asserted. Targets for general impact of the program on waste coverage rate, recycling amounts are not set.

European experience

It must be understood the main difference between the strategic waste management plan as defined in the European Directive and usual plans established by different administrations.

The strategic waste management plan is based upon technical data. It takes into account:

- ecological data (nature of waste, classification of waste, techniques of collection and disposal)
- technical data (location of waste production, location of waste treatment facilities)
- management data (existing organizations, capacities, tariffs)
- economical data (collection costs, transportation costs, treatment costs)
- financing data (financing capacities)
- socio-economical forecasts (demography, life level evolution)

The main steps of the plan are:

- to transform all the data in waste production forecast, global and detailed by main entities;
- to fix quantified objectives in aim to reduce the impact on environment of waste treatment;
- to define the way to target these objectives as concrete orientations;
- to ensure the availability of the necessary means;
- *in fine*, to fix the framework within whose the entities (in charge of waste management operations) are free to decide how they will manage waste.

Three scales of time

We have to distinguish 3 classical horizons of time:

- Policy: generally >10 years
- Strategy: 5 years
- Tactics: 1 year

Usually in Europe, the Regional SIWM Plan is a strategic plan. It organizes the main decisions about waste management for the next 5 years. In fact, it applies the policy defined by the State. For example in France, the 1992 law fixed the objectives to be targeted for 2002. Above the law are, for Europe, European regulations, fixing objectives. It's the same level of policy than the law. The 1992 law itself instituted the

regional waste management plans. Under the strategic plans, tactics is let to the local authorities and the industrialists which have to manage the waste and which have to take operational decisions, day to day, within an annual budget.

2.3.4 A policy of waste management

2.3.4.1 Mainframe

The State politics goals are defined in the Law of Ukraine "On Waste":

Article 5. Main Principles and Directions of the State Policy in the field of Waste Treatment

The main principles of the state policy in the field of waste treatment refer first of all to protection of environment and people's health from the negative impact of waste, assurance of rational use of raw materials and power resources, scientifically justifiable consideration of ecological, economic and social waste generation and utilisation interests of the society to ensure its sustainable development.

The main directions of the state policy for implementation of the indicated principles are the following:

a) assurance of collection of all of the waste, timely neutralisation and removal of waste, observance of ecological safety rules during waste treatment;

b) minimisation of waste generation, reduction of hazard presented by it;

c) assurance of a multipurpose utilisation of raw resources;

d) promotion of a maximum utilisation of waste through direct re-utilisation or alternative utilisation of waste presenting a resource value;

e) assurance of safe removal of waste, not subject to utilisation through development of relevant technologies, ecologically safe methods and tools of waste treatment;

f) organisation of control over the places or objects of waste disposal to prevent from a negative impact on the environment and people's health;

g) implementation of a set of scientific, technical and marketing research to identify and define a resource value of waste to ensure its efficient utilisation;

h) assistance in construction of waste treatment facilities;

i) social protection of people, working in the field of waste treatment;

j) compulsory record-keeping of waste based on waste classification and passportization.

For the present programme, we put as fundamental the item a) that we resume as 100% collected, 100% paid, 100% in safe and secure storage and the item f) as enhancement of the Inspection.

2.3.4.2 Objectives

The Regional Solid Industrial Waste Management Strategic Plan of the Oblast is established in aim to concretely apply within the territory of the Oblast the Law of Ukraine "On Waste".

The first Regional SIWM Plan of an Oblast is established for five years. It contains the measures decided by the authorities in aim to achieve concrete goals in waste management.

The general objective of the 5-year plan is to attain:

- 100% of the waste within the territory of the Oblast are collected by legally authorized utilities
- 100% of the waste fees are paid by the users
- 100% of the waste within the territory of the Oblast are disposed in safe and secure conditions, i.e. the most often in sanitary landfills

In parallel, in aim to prepare the next steps of a modern waste management, the secondary objectives are:

- To develop experiments of selective collection and recycling

- To develop experiments of organic waste composting
- To inventory dumpsites and landfills; to study and to begin the closure of the most hazardous of them
- To settle hazardous waste treatment facilities and to experiment their selective collection
- To take into account the European regulations as a model of wished state of art of waste management.

2.3.4.3 Responsibilities

Regional Administration

According to the Article 20 of the Law of Ukraine "On Waste", the Administration of the Oblast of Donetsk is in charge of the "*organisation of development and implementation of regional and local waste treatment programmes, assurance of implementation of state programmes"*. So the preparation of the Regional SIWM Strategic Plan is under the responsibility of the Administration of the Oblast.

Department of Ecology

According to the Article 23, Competence of the Ministry of Environment Protection and Nuclear Safety of Ukraine in the Field of Waste Treatment and its local offices, of the Law of Ukraine "On Waste", the Department of Ecology is in charge of the "*a) co-ordination of activities of other specially authorized executive bodies referring to waste treatment and control over implementation of requirements of ecological safety", "f) creation of information and analytical systems and data bases about volumes of waste generation and waste treatment*" and "*j) approval of locations of waste treatment sites*". So for the preparation of the Regional SIWM Strategic Plan of the Oblast, the Department of Ecology is in charge of the necessary studies and of the providing of the necessary data.

Local authorities

According to the Article 21, Competence of Local Authorities in the Field of Waste Treatment, of the Law of Ukraine "On Waste", the local authorities as Municipalities and Districts are in charge of:

b) development and approval of schemes of sanitary cleaning of populated areas;

c) organisation of household waste collection and removal, including waste of small businesses, creation of landfills for waste disposal, organisation of selective collection of useful components of waste;

d) approval of local and regional waste treatment programmes and control over their implementation;

e) introduction of measures stimulating subjects of economic activities, working in the field of waste treatment;

f) solution of questions dealing with location of waste treatment sites at their territory;

g) co-ordination of work of subjects of business activities located at their territory within their powers;

h) definition of the amount of payments for waste disposal in the order stipulated by law;

i) implementation of control over rational use and safe waste treatment at their territory;

j) liquidation of non-authorised and not controlled dumps;

k) promotion of waste legislation among population, stimulation of involvement of population to collection and storage of waste, presenting resource value;

Local authorities take decisions about allocation of land for waste disposal and construction of waste treatment sites.

So for the preparation of the Regional SIWM Strategic Plan of the Oblast, the local authorities will be associated by the way of the designation of representatives who will participate to the works, and they will be regularly informed of the preparation of the Plan.

Private companies and NGOs

According to the Article 16 of the Law of Ukraine "On Waste", the Companies, Institutions and Organisations of all forms of property working in the Field of Waste Treatment in the Oblast have a right to: "*a) receive information in the stipulated order about technologies of waste utilisation, construction and operation of waste treatment facilities*" and "*c) come out with proposals about location, design, construction and operation of waste treatment facilities"*. So the Companies, Institutions and Organisations of all forms of property (including NGOs) working in the Field of Waste Treatment in the Oblast are invited to participate to the works of the preparation of the Regional SIWM Strategic Plan of the Oblast by the way of the designation of representatives who will participate to the works, and they will be regularly informed of the preparation of the Plan.

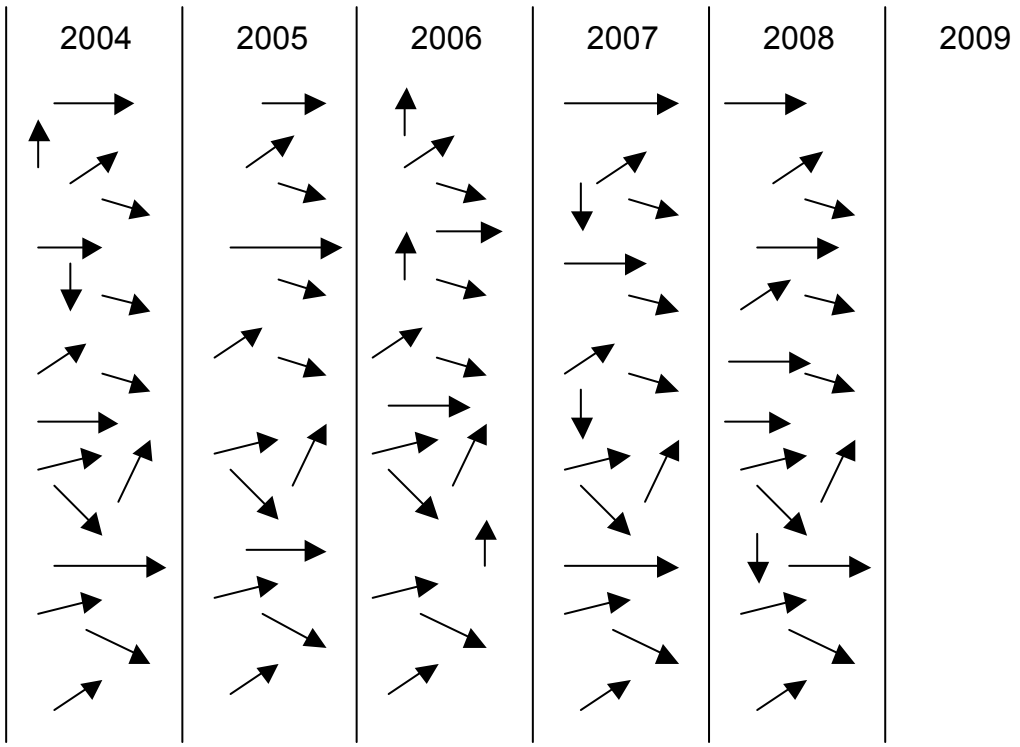
Democratic process

As far as possible, within the limits of the business secret, the principle of transparency will be applied to the works of the preparation of the Regional SIWM Strategic Plan of the Oblast. The minutes of meeting will be published. The preparatory studies will be published. The final document Regional SIWM Strategic Plan of the Oblast will be published and submitted to a public inquiry in aim to inform the population of the Oblast.

2.4 Major Goals of Strategic Programming

- Investment Programme

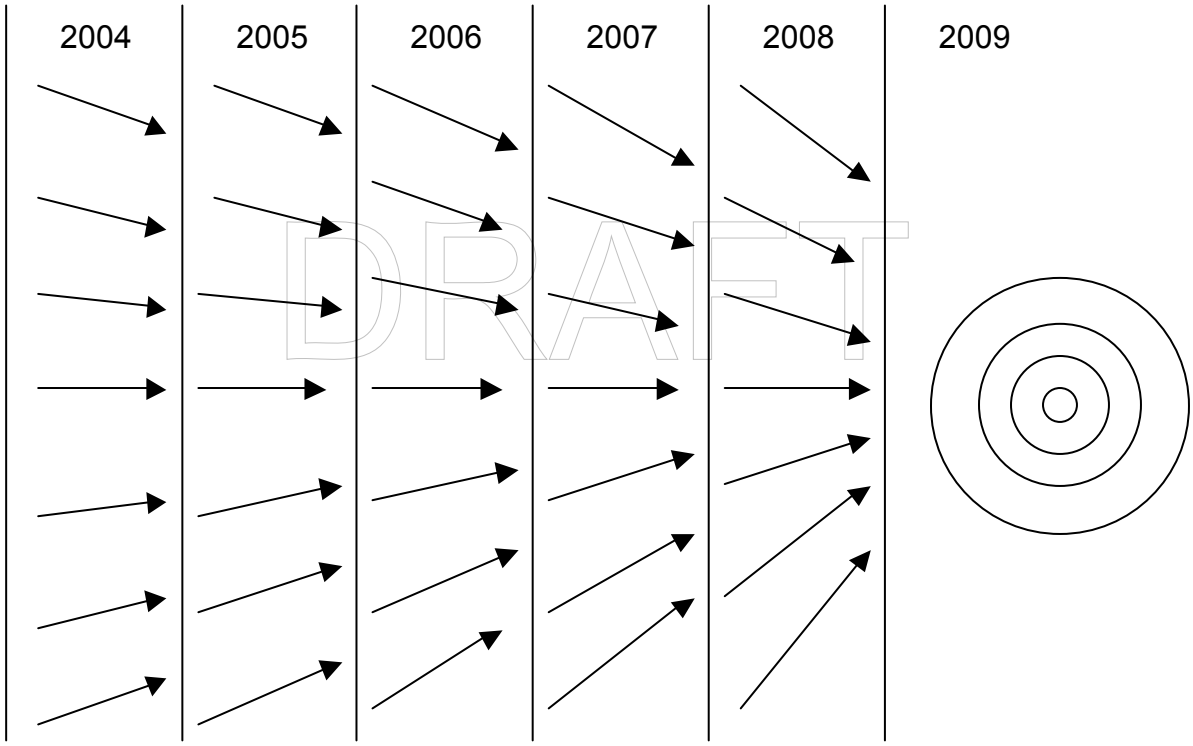
The usual practice can be defined as the accumulation of a lot of requests for subsidies, emitted by the local bodies, for a period of 5 years. It can be defined as an Investment Programme, in the measure the budget can afford that. The drawback is that each one sees its own preoccupations, so some projects can concurrence each other, or can be oversized or undersized along their life length. It can be illustrated as below.



A common drawback is as the Budget is annual and limited, there's a temptation (and a common use) to spread the available money among a lot of projects, so each project cannot be completely financed before a number of years.

- Strategic Plan

A Strategic Plan firstly defines the target. The target is a politic objective, reasonable according to the starting situation and the available means. So it becomes possible to sort the projects aiming the target and to size them correctly. It can be illustrated as below.



So it's also easy to decide to finance completely each year a few projects by having a straight view of the target and to manage a synchronization of all the projects. It must be also said that it's necessary to provide transition solutions because everything cannot be done at once.

2.5 Content of the Plan

The Regional Strategic Plan is the outcome of all the studies of the subject. So, naturally, it leans on the result of all these studies as the waste composition, the waste production, the landfills audit, and so.

The Regional Strategic Plan comprises the following parts.

2.5.1 Existing situation and prospective

It's important to have the as best view as possible of the existing situation of the waste management. It's not easy in a country which is at the first beginning of a modern waste management. The existing data have turned out that they were obsolete or incomplete. So the Tacis Programme of Donetsk worked all along the first year to establish the true figures of the waste management.

But the Plan aims to forecast mid and long term needs. So the preparation of the Plan included the collection of socio-economical data and forecasts because the production of waste is linked (in terms of quantity and of composition) to the economy and particularly to the industry.

This part of the Plan includes:

- General framework: demography, geography and equipment, economy
- Legal framework
- Production of waste
- Existing collection system
- Financing management of the waste disposal
- Landfills
- Prospective

The Plan addresses to non-specialists so some parts have been developed in aim to explain not only the data but also why these data are necessary and how they were obtained.

2.5.2 Objectives

As said in §2.4, the notion of "strategic" plan is to aim a target. This part distinguishes long term political objectives, which are like principles which will drive the public action in the future and which explain why decisions will be taken, and strategic objectives which are the targets of the Plan and are already decisions.

The strategic objectives which must be adopted are:

- 100% waste collected in 2009;
- 100% costs paid in 2009;
- 100% waste in sanitary landfills in 2014;

and to help that:

- to increase awareness of the enterprises and of the authorities;
- to develop capacities of recycling;
- to experiment alternative techniques.

2.5.3 Action Programme concerning the production, the collection and the disposal

After the objectives, the Plan says what to do concretely: how to pass from the existing situation to the objectives.

2.5.4 Action Programme concerning the disposal of ultimate waste

The landfilling of ultimate waste (the waste that cannot be re-used or recycled) is a particular problem. The construction of sanitary landfills is a big investment and it must be spread on a decade. These sanitary landfills require specific geological and hydro-geological conditions and their location is submitted to these conditions. They must have a minimal size (for an economical optimisation) and must deserve a large population basin, and so they must be associated with transfer stations.

In parallel, the waste must be disposed every day and existing landfills must be used for that as long the new sanitary landfills will not be built. So an inventory will qualify the best existing landfills that can be reasonably (from an environmental point of view) used for some time.

A transition Plan will propose a step by step approach for the construction of the new sanitary landfills and the continuation of existing landfills.

2.5.5 Financing, realization, and follow-up of the Plan

The feasibility of the Plan is mainly a question of financing means. So this part evaluates the cost of the Plan and the capacity of financing.

An other condition of success is the follow-up of the Plan. The execution of the Plan must be continuously checked and usually a yearly progress report is published. It supposes to create a permanent structure which will also update the Plan and prepare the next Plan.

3 Steps of the institutional program

3.1 Administrative Context

3.1.1 Legal Basis

3.1.1.1 A policy of waste management

The State politics goals are defined in the Law of Ukraine "On Waste":

Article 5. Main Principles and Directions of the State Policy in the field of Waste Treatment

The main principles of the state policy in the field of waste treatment refer first of all to protection of environment and people's health from the negative impact of waste, assurance of rational use of raw materials and power resources, scientifically justifiable consideration of ecological, economic and social waste generation and utilisation interests of the society to ensure its sustainable development.

The main directions of the state policy for implementation of the indicated principles are the following:

a) assurance of collection of all of the waste, timely neutralisation and removal of waste, observance of ecological safety rules during waste treatment;

b) minimisation of waste generation, reduction of hazard presented by it;

c) assurance of a multipurpose utilisation of raw resources;

d) promotion of a maximum utilisation of waste through direct re-utilisation or alternative utilisation of waste presenting a resource value;

e) assurance of safe removal of waste, not subject to utilisation through development of relevant technologies, ecologically safe methods and tools of waste treatment;

f) organisation of control over the places or objects of waste disposal to prevent from a negative impact on the environment and people's health;

g) implementation of a set of scientific, technical and marketing research to identify and define a resource value of waste to ensure its efficient utilisation;

h) assistance in construction of waste treatment facilities;

i) social protection of people, working in the field of waste treatment;

j) compulsory record-keeping of waste based on waste classification and passportization.

For the present programme, we put as fundamental the item a) that we resume as 100% collected, 100% paid, 100% in sanitary landfills and the item f) as enhancement of the Inspection. In parallel, the landfill inventory and audit subprogram aims the item j) *liquidation of non-authorised and not controlled dumps;* of the ***Article 21. Competence of Local Authorities in the Field of Waste Treatment***.

3.1.1.2 Institutional framework of waste management

The activities in the field of waste treatment are managed through a system of state bodies: central bodies of state and executive power, regional governing bodies, local self-government bodies and their executive committees. The functions of organisational structures exercising the management at the regional level are determined by the laws of Ukraine: "On Waste", "On Local Self-Government", "On Local State Administration", etc.

Competence of local state administrations and self-government bodies

In accordance with Article 20 of the Law of Ukraine "On Waste" the competence of state administrations as regards waste treatment includes:

c) ***organisation of development and implementation of regional and local waste management programmes*** *as well as assurance of implementation of national programmes;*

*g) **development of schemes for sanitary cleaning of populated areas;***

h) organisation and assistance in creation of specialised companies of all forms of ownership for collection, treatment, utilisation and disposal of waste as well as for production, installation and maintenance of the relevant equipment;

*j) **organisation of collection and disposal of household and other types of waste,** including the waste of small manufacturers, construction of landfills for waste disposal as well as implementation of selective collection of useful components of waste;*

*m) **assurance of liquidation of unauthorised and uncontrolled dumps** either by itself or upon the decision of the relevant authorised bodies, etc.*

During preparation of local budget drafts local state administrations are to submit proposals as regards the attraction of money necessary for implementation of waste treatment activities".

Thus, the development and implementation of the Regional SIWM Strategic Plan is within the competence of the regional state administration.

In accordance with Article 30 of the Law of Ukraine "About Local Self-Government" such issues as collection, transportation, utilisation and neutralisation of household waste are within **the competence of local self-government bodies.**

According to Article 21 of the Law "On Waste" the local self-government bodies are to ensure:

b) development and approval of schemes of sanitary cleaning of populated areas;

c) organisation of household waste collection and removal, including waste of small businesses, creation of landfills for waste disposal, organisation of selective collection of useful components of waste;

d) approval of local and regional waste treatment programmes and control over their implementation;

e) introduction of measures stimulating subjects of economic activities, working in the field of waste treatment;

f) solution of questions dealing with location of waste treatment sites at their territory;

j) liquidation of non-authorised and not controlled dumps;

k) promotion of waste legislation among population, stimulation of involvement of population to collection and storage of waste as secondary raw materials;

l) issue of permissions as regards allocation of sites or facilities for waste storage and disposal at the territory of a village, settlement, city…

etc.

Local authorities take decisions about allocation of land for waste disposal and construction of waste treatment sites".

Thus, the adoption of the developed Regional SIW Management Strategic Plan for the Oblast is within the competence of the Regional Council.

Competence of specially authorized bodies of executive power as regards waste treatment

State Department of Ecology and Natural Resources

1. In accordance with Article 23 of the Law of Ukraine "On Waste", **the competence** of the Ministry of Environment Protection of Ukraine and its local bodies, i.e. the **State Department of Ecology and Natural Resources in Oblast** includes:

"*a) co-ordination of activities of other specially authorized executive bodies referring to waste treatment and control over implementation of requirements of ecological safety*",

b) implementation of state control over the observance of environment safety requirements,

"*f) creation of information and analytical systems and data bases about volumes of waste generation and waste treatment*",

g) issue of permissions for implementations of waste treatment operations in accordance with the legislation,

"*j) approval of locations of waste treatment sites*", etc.

So for the preparation of the Regional SIWM Strategic Plan of the Oblast, the State Department of Ecology and Natural Resources of the Oblast is in charge of creating the database as regards industrial waste treatment and volumes of waste production.

Sanitary and Epidemiological Service

2. In accordance of Article 24 of the Law of Ukraine "On Waste", the competence of sanitary and epidemiological service of Ukraine and its local bodies includes:

"a) implementation of state sanitary and epidemiological supervision over implementation of state sanitary norms, rules, hygienic norms during waste generation, collection, transportation, storage, processing, utilisation, removal, neutralisation, disposal;

c) implementation of state sanitary and epidemiological expertise of design and estimate documentation for identification of location and technical and economical justification of projects dealing with construction, extension and reconstruction of waste treatment facilities;

d) issuing expert conclusions of the state sanitary and hygienic expertise as regards waste treatment facilities;

e) setting sanitary and hygienic requirements for products produced from or including waste and issuing hygienic certificates for the same; etc.

At the regional level the functions dealing with state supervision over observance of sanitary norms and rules in the process of sanitary cleaning of the territory of the Oblast are exercised by the **Regional Sanitary and Epidemiological Station.**

State Company (SC) "UkrEkoKomResurcy"

State Company "UkrEkoKomResurcy" created in accordance with the resolution of the Cabinet of Ministers of Ukraine as of 26.07.2001 N° 915 "On Implementation of the System of Collection, Sorting, Transportation, Recycling and Utilisation of Waste of Secondary Raw Materials" is to carry out ecological activities throughout the territory of Ukraine aiming at collection, sorting, recycling and utilisation of solid waste as secondary raw materials. It is also supposed to contribute to decrease the volumes of solid waste generated as well as to reduce the negative impact of waste on the environment. The company has its own production capacities as well as material and technical resources necessary for introduction of a system of collection, recycling and utilisation of solid waste as secondary raw materials (it has its own plants for production of equipment and the possibilities to create waste sorting facilities and containers for collection and recycling of secondary raw materials).

By series of resolutions, including the ones as of November 26, 2003 N° 1844, the Cabinet of Ministers of Ukraine has practically created a legal and economic framework for organisation of the systems of collection, sorting, transportation, recycling and utilisation of waste as secondary raw materials.

By now the state company "UkrEkoKomResurcy" has almost solved the issues of:

1. Creation of a state structure for development and organisation of the system of collection, sorting, transportation, recycling and utilisation of waste, including containers (packages) of domestic production, as secondary raw materials by delegating the corresponding functions of the state company "UkrEkoKomResurcy" to its structural sub-divisions represented by regional directorates and production sites in cities and districts.

2. Use of single state tariffs for delivery of services dealing with collection, transportation, recycling and utilisation of used containers (packages) by all economic operators not depending on their forms of ownership.

3. Licensing of activities for collection, sorting, transportation, recycling and utilisation of waste.

4. Utilisation or withdrawal from Ukraine of containers (packages), brought by importers of goods at the expense of these importers by application of fixed state tariffs.

5. Utilisation of containers (packages) at the expense of economic operators that use such containers (packages) for their goods at the whole territory of Ukraine where these goods are produced.

6. Distribution of incomes, accumulated at the account of the state company "UkrEkoKomResurcy" for delivery of services as regards collection and utilization of containers (packages) and transfer of 90% of these resources to regions in order to finance investment projects and create a material and technical base for implementation of selective collection, sorting, recycling and utilization of waste.

The state company "UkrEkoKomResurcy" and its structural subdivisions together with directorates and departments of the regional state administration, regional council, executive committees of city and district councils develop and implement Comprehensive programmes for organization of selective collection, recycling and utilization of waste.

ENTITIES INVOLVED IN WASTE TREATMENT

The law «On Waste» specifies the subjects of waste treatment activities. These are the citizens of Ukraine, foreigners, companies, institutions and organizations involved in waste treatment. All types of organization so can be involved in the treatment of waste.

However, we should take into account unauthorised activities of certain categories of low-income citizens which can be observed nowadays in the field of waste treatment. These activities cover collection, sorting and storage of secondary raw materials (waste paper, glass, metals, polymers) but cannot be officially registered.

PRIVATE COMPANIES AND NGOS

According to the Article 16 of the Law of Ukraine "On Waste", the Companies, Institutions and Organisations of all forms of property working in the Field of Waste Treatment in the Oblast of Donetsk have a right to: "*a) receive information in the stipulated order about technologies of waste utilisation, construction and operation of waste treatment facilities*" and "*c) come out with proposals about location, design, construction and operation of waste treatment facilities"*. So the Companies, Institutions and Organisations of all forms of property (including NGOs) working in the Field of Waste Treatment in the Oblast are invited to participate to the works of the preparation of the Regional SIWM strategic Plan of the Oblast by the way of the designation of representatives who will participate to the works, and they will be regularly informed of the preparation of the Plan.

3.1.2 Geographic Justification of the Plan

At this step, the Plan has been developed for the territory of the Oblast. It's usual in Western Europe to consider the particular situation of the cross-border co-operations in waste management between local authorities belonging to different regional bodies. For the moment, we have considered that the co-operations between local authorities within the Oblast are enough difficult to let aside the question of inter-oblasts co-operations. It stays that specialized facilities for some hazardous waste can exist in a neighbour oblast and it has to be taken into account.

3.1.3 Responsibilities and Coordination

As a project, the Plan will necessarily have to be *situated*, in the sense where it will have to fit with the administrative, geographical, sociological, economical, environmental, cultural, etc., particularities of the territory on which it will be implemented.

It will also have to be elaborated in a *deliberative* way, in the sense where not only the goals of the plan and the means used to achieve these goals, but also the process of the elaboration of the plan and the means of monitoring of its realisation should be the objects of a sincere deliberation between all the concerned persons and bodies. By this way, the dialog process itself will be understood by every bodies participating to it: they will thus be able to understand exactly at which level of authority each meeting takes place. The aim is also to build collectively a process that will fit with the habits and particular preoccupations of every body.

A deliberative process (instead of a totally pre-built procedure) puts everybody in face of its responsibility, and defuses every criticism on the process itself by advance.

The goal of this totally opened deliberation is to ensure that the plan will be really understood and appropriated by the administration and the authorities who will have to make this plan effective and credible with the eyes of the population. We know indeed that an active and volunteer participation is necessary to the quality and relevance of the result of this kind of project.

Thus not only the plan itself, but also the process of its elaboration, its implementation and its realisation will have to rest on a dialog process.

3.1.4 Establishment of the Planning Authority

The Planning Authority must have an authority on the subject. According to the texts, this authority is shared between the regional state administration and the regional Department of Ecology (*Bodies of local self-government shall decide on the allocation of plots for placement of wastes and the construction of waste management facilities*. Art 21 of the Law on Waste). But the application is mainly in the hands of the Department of Housing and Communal Services (for the common industrial waste) and under the control of the Sanitary and Epidemiological Service. For the hazardous waste it's only specified in Art. 17 of the Law on Waste that the enterprises have to:

"(e) secure complete collection, proper storage of wastes, and prevent the destruction of wastes of salvage value that are subject to reclamation [recycling];

(f) participate in the construction of waste management facilities;

(n) secure the development and implementation of waste management plans;"

One main problem in Ukraine is that the law defines an obligation for the producers to dispose their waste is regulated conditions, and an obligation to apply waste management planning. Nothing defines the appropriate technologies to be used for each waste, the appropriate means, the control of the relevant facilities. In fact, it seems it is supposed that the market will generate spontaneously the facilities for all species of hazardous waste and that everybody will use them !

For the moment, the Planning Authority must be a Department of the regional state administration but it's difficult to say which one.

3.1.5 Composition of the Commission

The composition of the Commission must be decided according to the principles of the §2.3.2.

3.1.6 Choice of the Members of the Planning Authority

A document of information must be sent to the entities composing the Commission and it must be asked them to name a delegate.

3.1.7 Role of the Planning Authority

The role of the Planning Authority is:

- to name the members of the Commission;
- to establish the general work planning;
- to allocate the necessary means;
- to decide and to finance the execution of the studies asked by the Commission;
- to endorse the Plan established by the Commission;
- to take the orders for the application of the Plan.

3.1.8 Organisation of the Studies

The State Department of Ecology and Natural Resources of the Donetsk Oblast asked in 1999 a help from the European Union. In 2002 the European Union entrusted to the consortium Thales EC & GKW the programme EuropeAid/112554/C/SV/UA “Improvement of Solid Household Waste Management in Donetsk Oblast of Ukraine” whose beneficiaries are the Ministry of Environment of Ukraine and Donetsk Regional State Administration and whose main recipients are the State Department of Ecology and Natural Resources in Donetsk Oblast and the Department of Housing and Public Utility Services of the Regional State Administration.

The experts of the Tacis Programme (both foreign and Ukrainian) have worked all over 2003 on the analysis of the situation and the gap between the on going situation and the international standards. The results of all these studies are used for the preparation of the Regional SIWM of Donetsk.

Out of this particular case which requires 70 man x months of European Experts and some 200 man x months of Ukrainian experts, it must be clear that these studies are of the level of a full Tacis Programme. They are more complex for industrial waste than for household waste. The household waste is a standard waste, even if the composition of the household waste and the evolution of this composition is of first importance for the development of the recycling. The industrial waste is in fact a lot of thousands particular waste. It's why the question of the nomenclature of industrial waste is so important. It's why the studies are more numerous and more technical.

3.2 Realisation of the Plan

3.2.1 Content of the Plan

The Plan must be concluded by a work programme deciding year by year what has to be done each year. The feasibility of this work programme depends mainly of the state of the economy. It’s not enough to build waste treatment facilities. The cost of the treatment of the waste must be affordable for the producers. So a particular attention must be paid to the Business Feasibility Studies for each project of new facility. These studies, or their summary, must be included in the Plan.

3.2.2 Financing the Plan

The former soviet practice was the financing of all these facilities by the state budget. The Western European practice is the financing of all these facilities by the private capital and the industrial and hazardous waste market is a free market. Ukraine is in the middle of the ford.

The involvement of the State in the creation of the market of SIWM cannot be a long term strategy but can powerfully help to launch this market. The IFIs and the banks can fund if the business plans are of a good quality. Some grants can help or finance demonstration projects. Perhaps some venture capitalists are ready to invest in SIWM. The industrial companies themselves can gather and invest in the facilities they need in aim to apply the regulation for their own waste. All that is possible. The Plan will have a specific task to explore the different possibilities to finance the creation of the required facilities.

3.2.3 Role of the multilateral public dialog

This dialog process cannot be limited to a series of bilateral meetings between the responsible body and the others concerned bodies. In this case, there would be a risk that the process turns to only a series of *hearings*, with a responsible body making arbitrations, and it appeared in European Union that it is far more profitable to organise a multilateral dialog between all the concerned organisations. The frame of this multilateral dialog could take place in what could be called the "Working Group of the Plan", since the notion of working group is well associated with the idea of deliberation and is easy to translate in many languages.

3.2.4 Mass-Media Campaign Strategy

On one hand, the inhabitants are often complaining of the pollution by the industry. On the other hand, the neighbours are never pleased to discover the project of a waste treatment facility at their door (syndrome NIMBY = Not In My Back-Yard). It's of a first importance to inform the public of the SIWM Plan. The advantages are:

- the message that "the authorities are conscious of the problems and they manage them";
- the message "it's necessary to build such facility in aim to control such problem" will pass before to say "it will be built there";
- the yearly results of the Plan will be published and prove that it's necessary to manage the SIW and if possible that it is successful.

3.2.5 Plan Approval

The Plan must be endorsed by the Regional Council.

3.3 Procedures for Public Hearings and Approval

In Western Europe, there's often a procedure of public hearings and approval of the Plan (see the Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC).

In North America, the instruction of the projects can be done in front a Court and everybody can express his arguments but must justify them, including the Administration.

It seems that for the moment in Ukraine, it can only be proposed to organize some public debates around the presentation of the Plan. The conditions should be determined by a law or a regulation.

3.3.1 Content of the Dossier to be Submitted

For a large information of the different publics (producers of waste, administrations and local authorities, press, general public) a document of presentation of the Plan must be published and largely distributed.

This document must explain very technical matters to a non-expert public. So a particular attention will be paid to popularise the content of the Plan.

3.3.2 Approval of the Plan

It should be premature to ask the public to approve the Plan as it is done in Western Europe. But it's important to collect the opinion of the public and to answer the legitimate anxiety. The conditions should be determined by a law or a regulation.

3.4 Follow-up Organisation

The execution of the Plan must be checked. The Plan must be periodically updated. The next Plan is to be prepared.

3.4.1 Objectives of the Follow-up

The best studies cannot forecast all the details of the future. Some unexpected events must be taken into account during the lifetime of the Plan. So the Plan must be continuously linked on the reality, and in case of a major event, the Plan must be adjusted by an amendment.

It's convenient as we said to publish a yearly report of the execution and the effects of the Plan.

At least, one or two years before, it's necessary to dispose of the freshest data for the preparation of the next Plan.

3.4.2 What to Check?

3.4.2.1 Production of waste

It's not only to collect the figures of the passports of waste. Some inquiries or the reports of the Inspectors can detect some waste which are not under the definition of the " Total Index of Waste Generation " of the regulation.

During the period of the on going Plan, new facilities may appear, old facilities can close. This life of the enterprises must be integrated in the follow-up of the Plan.

3.4.2.2 Waste disposal

The Plan inventories existing facilities and projects for the waste disposal (including transportation, treatment, landfilling, recycling, and so). The projects are scheduled in the annual work programmes. The evolution of the existing facilities and the implementation of these projects must be checked and included in the yearly report of the execution of the Plan.

3.4.2.3 Results on the biosphere

If it exists, the data of the monitoring of the environment can be integrated in the follow-up in aim to show the results of the policy of SIWM.

3.4.3 Organisation of the Follow-up

The follow-up requires a minimum of means. Usually there's a structure called PWO – Permanent Waste Observatory. Two competencies are necessary: an economist (+ statistics and computerization) and an engineer (industry – environment). The PWO must access to the data of the DOE. It must dispose of an office with classical equipments (furniture, computers, telecommunications). Two key-points must be noticed: a) the computerization of the passports will facilitate all that; b) all the results should be integrated in a geodatabase.

At least, in the 2000's, the follow-up of the Plan must be permanently published on a website.

4 steps of the technical programME

4.1 Diagnostic Phase

Relevant Project Context

The general purpose of the plan is to improve the sanitary and ecological state of the region, considered as polluted, mainly due to industrial activities.

The main assumption is that the past deterioration of the situation has been caused by a lack of awareness of the waste situation, which has turned in low priorities in economic and organisational decisions. Population and companies were not conscious of the potential health issues, did not care enough about environment, and were reluctant to pay for what is considered up to now as a useless expense. Budget financing by the local administrations put low priority to upgrade facilities, and to offer decent wages to administration staff and workers involved in this sphere. Low revenues made the business not attractive for the private sector.

Present state of the SIWM

There's a lot of obligations by the law and the regulation and no practical means to apply them, as the corresponding specialized waste transportation and hazardous waste treatment facilities. The usual issue is penalties which are of a ridiculous amount for the industry.

4.1.1 Analysis of the Existing Programme

The 1998 law «On Waste» shifts the responsibility for waste removal and treatment to the municipalities. This has caused a splitting of the responsibilities between areas, a multiplicity of local facilities. Each municipality tries to solve the waste issues by itself, and rejecting assistance to neighbour (typical of the NIMBY syndrome). This approach deprives the region from a co-ordinated policy, makes difficult the construction of a lesser number of larger regional sites, more efficient and easier to control, does not allow to minimise the risks. The only way for the Region administration to have a control on the process relies on the distribution of budget funds for new investments.

Although long-term planning is well developed in Ukraine, one of the main issues to address in the SIWM is the lack of a long-term strategy involving all actors, with proper forecasts of waste fluxes and investments needs, based on well experimented and modern technologies.

A particularly severe aspect of the problem lies in the liquidation of old landfills, not complying with the European standards, linked with the difficulties to create new facilities, accepted by the population. New facilities, respecting modern ways of exploitation, minimise drawbacks for neighbours. Absence of co-operation between areas results in attempt to deprive the municipalities from their responsibilities and transferring to regional companies.

4.1.2 Economical Context

The SIW production is fully linked to the economical situation. It depends obviously of the facilities, their birth, their evolution, their death. Incidentally, the death of the enterprises let often a lot of waste in charge of the authorities (orphan waste, contaminated soils). So it's necessary in aim to forecast the production of SIW for the next 5 and 10 years to understand the economical situation.

4.1.2.1 Demography

This part concerns the understanding of the targets of the pollution by industrial waste. A pollution is a chain emission – pathway – target. The urgent objective is to improve the health of the inhabitants by a reduction of the flows of pollution they are submitted.

4.1.2.2 Geography and equipment

A particular attention must be paid to the description of the urban and industrial areas of the region, and to the transportation networks (roads, railways).

But this part must also describe the pathways of the pollution by the industrial waste which mainly the water. It should be good to include a map with the main water resources and the intakes for the feeding of the tap-water.

4.1.2.3 Economy

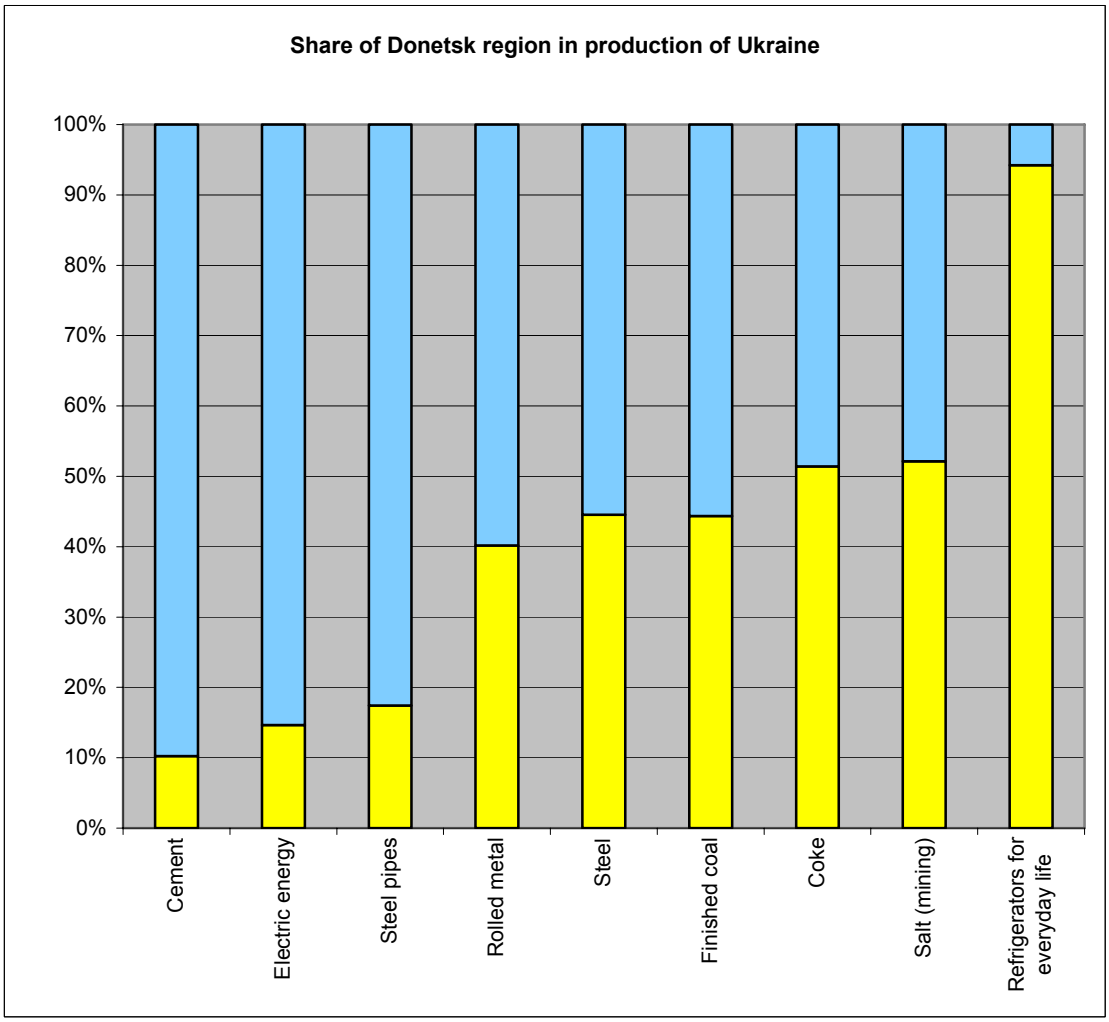
Example of Donetsk

Donetsk Oblast is rich with mineral resources providing for the demands not only of the region but of Ukraine as a whole (altogether 36 types, the main ones being coal, rare metals, mercury, table salt, chalk, kaolin, lime, gypsum, etc.).

Industrial Production

- Part in regional GDP: 66.2%
- Part of the Oblast in the national industrial production: 20%

Graph 1 Share of Donetsk Region in the production of Ukraine



- Main specialities : heavy industry (> 50% of the production), mining industry, chemical industry.

At the 1st January 2003, there were in the Oblast:

- 848 industrial companies
- 431 construction companies.

	1995	2000	2001	2002
Industrial goods (factual prices) of all industries, mln. UAH	12 047,5	27 493,5	35 489,4	38 593,8

Agriculture Production

- Part in regional GDP: 5.4%
- Part of the Oblast in the national agricultural production: 4.7%
- Part of the private sector: 53.2%
- Main specialities: fruits and vegetables, cereals, sunflower, potatoes, breeding

At the 1st January 2003, there were in the Oblast:

- 143 state agricultural companies, including 13 collective farms
- 847 non state agricultural companies
- 2168 farms.

	1995	2000	2001	2002
Agricultural goods (expressed in prices of 2000), mln. UAH	3 415,1	2 943,1	3 562,4	3 570,0
- Cultivation of plants	1 915,0	1 773,7	2 264,9	2 095,0
- Animal breeding	1 500,1	1 169,4	1 297,5	1 475,0

4.1.3 Production of industrial waste

4.1.3.1 Definition of the waste concerned by the plan

There are no standards in Ukraine regulating industrial waste treatment. As far as waste terminology is concerned, the Ukrainian “Law on Waste” gives definitions of the main terms such as “waste”, “hazardous waste” but doesn’t specify “solid household waste” neither "common industrial waste".

“The Procedure of Service Delivery for Collection and Disposal of Solid and Liquid Domestic Waste”, approved by the Order N° 54 as of 21.03.2000 of the State Committee of Architecture and Housing Policy, provides the following definition of solid household waste.

Solid household waste (SHW) is the waste generated as a result of human activities and accumulated in residential buildings, social and cultural establishments, public, educational, medical, trade and other organisations (these are the food waste, household appliances, garbage, fallen leaves, waste resulting from cleaning or renovating apartments, waste paper, glass, polymeric materials, etc.) which can no longer be used at the place they have been generated.

Thus, during the development of the present plan the following waste is taken into account:

- Common non-hazardous waste of commercial enterprises, administrative buildings and institutions.

4.1.3.2 Tonnage

As nowadays in Ukraine there is no state primary registration of data, no single form of state statistic reporting concerning the volumes of waste generated, disposed and accumulated the result is that there is no reliable data. What makes the situation worse is that SIW disposed is never weighted. SIW dumps and even landfills recently built are not systematically equipped with weighting equipment. The registration of SIW collected and disposed at dumps/landfills is done in terms of volumes in m^3 by calculation methods or

by fact (through the volumes of containers). But it's clear that 1 m^3 of waste is not the same quantity in the container (150-250 kg/m^3), in the truck (250-400 kg/m^3) and in the landfill (500-1000 kg/m^3)!

Nevertheless it exists the passportisation of waste where the figures of the production of waste are given in tons. But the given tons are the more often calculated on the base of an estimated volume; these declarations of the producers cannot be controlled by a lack of means; the passportisation of waste is an obligation for the companies producing more than 1000 t/y of " Total Index of Waste Generation ", so the data registered cannot be exhaustive; the data are not systematically compiled but used when it's asked a table for the statistics of an administration.

Figures from Donetsk

About the common industrial waste, the data obtained by asking all administrative units are very far of this theoretic production. Very often the expressed figures in tons are only the result of a calculation applying a standard rate of 0,25 t/m^3 to the quantities in volume. In fact, the obtained figures are generally based upon the capacity of the collection containers and the number of truck rounds.

In the *Table 1* are inserted the figures from the Department of Housing and Public Local Utilities of Donetsk as it calculates the production of household waste and the figures of the commercial waste (waste from commerce, craft industry, collective equipments) and the municipal waste (markets, street cleansing, but also the picking up of wild dumpsites). It can be seen that the commercial waste production is half the production of household waste (in volumes).

Figures from Chernivtsi

In Chernivtsi we explored the data of the passports (cards of registration). The resumed results are in the *Table 2* and ask some comments.

Classes

The production of waste is defined by classes in the Ukrainian regulation.

Class 1: the most hazardous

The only one declared waste are the neon tubes and the used oils, with very small quantities (around 1 t/y).

Class 2

The declared waste are used oils and batteries with small quantities (< 10 t/y).

Class 3

No declared waste in this class.

Class 4: the less hazardous

The quantities are important for some organic waste as pulp of beet root (100,000 t/y). In fact, the class 4 waste should be classified as non hazardous waste in the European classification: they can be considered as household waste. The organic waste are not relevant of a regional planning according to the Eurpean directives but of local solutions in concertation with the agriculture (use as fertilizer). The other waste (with wood, metals, ...) that are not recyclable in their state can be disposed with the household waste, moreover the declared quantities are weak (some hundreds t/y).

Figures

- Only 6 plants provided (in 2002 and 2003) the registration cards to the Department of Ecology, including the water supply public company. It's used to say in Chernivtsi that there's 12 industrial companies submitted to this obligation.
- The registration cards are not checked. They include a lot of mistakes and sometimes missing information.

- Some registration cards seem to have been written by the same consultant, reproducing the same mistake or fantasy, as the following composition of used tyres which appear 4 times on 5:

Rubber	3.5 %
Sulphur	22.2 %
Acid stearic	1.7 %
Metal	72.6 %

- The neon tubes are accounted in pieces.
- Often the information of composition is indicated for standard waste, which is no use as for tyres or neon tubes, although the research of contaminants as heavy metal is missing for specific waste.
- Some quantities appear with 7 significant figures (2689,526 tons/year for the broken bricks of the brick factory) although there's no weighbridge.

Nevertheless, the registration cards is a good procedure for the waste management. It must be seriously improved by: a) information and training of the personnel of the companies; b) research by laboratory analysis of heavy metals, hydrocarbons and halogenated hydrocarbons for some waste produced in large quantities; c) training and means for the Inspection in aim to be able to check seriously the declarations; d) all that could be facilitated by a computerization.

4.1.3.3 Comments

The declared quantities of hazardous waste are insufficient to justify a regional planning on an Oblast as Chernivtsi. These quantities cannot justify the implementation of treatment facilities. Even a collection centre should be difficult to justify in comparison with direct expeditions. For such an oblast, a larger geographic zone should be envisaged for a planning of the collection and the disposal of hazardous waste.

About organic waste, solutions must be looked for in the agriculture sector, without to be relevant of a true planning in the sense of the European directives.

About common industrial waste, the censed quantities don't justify a specific equipment: they can be disposed with the household waste.

The necessity of a national planning of hazardous waste is confirmed by the visit of the cement plant "JSC PODILSKY CEMENT" sited at the limit of the Chernivtsi Oblast. This important unit is on going of energy retructuration: the natural gas kilns will be replaced by coal kilns allowing so to burn waste: tyres, agro-food waters, industrial waste, ...

It should be urgent to elaborate a Ukrainian regulation, inspired by the European directive about co-incineration of some waste, in aim to put a frame this co-incineration in cement kilns. It must be paid an attention to forbid the co-incineration of some waste as pesticides which for the incineration in cement kilns is not appropriated.

Only some enterprises are concerned for significant quantities of valuable waste. They are mainly agro-food enterprises. During the mission of September in Chernivtsi, the presentation of the problems met by these enterprises showed that the possibilities of valuation of these waste are in fact very changing from one year to the other, depending of the opportunities of valuation in other enterprises. The help to give to these enterprises should be better as "waste studies" for each concerned enterprise. These studies should allow to list the technical possibilities, the opportunities of valuation, taking into account the economical approaches.

	Population 01/01/03 x 1000	Surface km²	Volumes of SHW collected in 2002						Density of SHW kg/m³	Volume of SHW per capita (residential sector) m³/year
			Residential sector m³	tons	Commercial waste (except for residential sector) m³	Municipal waste m³	Total m³	Data of Dept of Housing and Public Utility Services m³		
Oblast (total)	**4 774,4**	**26 517,5**	**2 564 438**	**648 762**	**1 192 959**	**383 612**	**4 139 601**	**3 457 100**	**253**	**0,537**
Cities (total)	**4 059,0**	**4 941,9**	**2 408 071**	**596 238**	**1 096 587**	**282 883**	**3 787 436**	**3 215 200**	**248**	**0,593**
Donetsk	1 026,0	570,7	840 166	210 041	243 955	76 600	1 160 721	1 081 200	**250**	**0,819**
Avdeyevka	36,9	29,3	38 457	8 653	33 627	6 100	78 184	36 400	**225**	**1,042**
Artemovsk	112,0	73,6	69 046	21 190	34 892	4 344	108 282	66 300	**307**	**0,616**
Gorlovka	309,4	422,5	115 000	14 950	45 000	25 000	185 000	133 200	**130**	**0,372**
Debaltsevo	51,2	37,5	64 764	16 196	69 818	3 460	138 042	11 700	**250**	**1,265**
Dzerjinsk	85,1	61,9	19 828	4 957	15 025		34 853	27 600	**250**	**0,233**
Dimitrovo	55,1	22,8	47 112	11 778	4 184	660	51 956	57 300	**250**	**0,855**
Dobropolye	70,4	19,8	67 200	16 800	67 523	6 189	140 912	60 000	**250**	**0,955**
Dokuchayevsk	25,0	118,9	9 324	2 331	23 089	727	33 100	32 400	**250**	**0,373**
Drujkovka	74,3	46,5	39 148	9 826	20 046	3 972	63 100	57 900	**251**	**0,527**
Yenakievo	157,8	425,2	64 670	23 345	17 708	3 602	85 981	69 100	**361**	**0,410**
Zhdanovka	14,5	2,0	24 791	4 958	3 052	4216	32 058	20 900	**200**	**1,710**
Kirovskoye	30,4	7,0	50 000	12 500	4 000	121	54 121	50 000	**250**	**1,645**
Konstantinovka	93,1	66,0	21 000	5 250	19 250	5 540	45 790	46 600	**250**	**0,226**
Kramatorsk	213,5	355,7	103 598	27 454	34 323	3 488	141 409	142 200	**265**	**0,485**
Krasniy Liman	53,0	1 209,8	54 113	13 530	55 920	3 217	113 250	90 900	**250**	**1,021**
Krasnoarmeysk	82,2	39,2	14 637	2 214	2 000	2 030	18 667	10 700	**151**	**0,178**
Makeyevka	426,4	425,7	105 843	26 910	68 258	43 893	217 994	300 700	**254**	**0,248**
Marioupol	509,8	243,9	372800	93000	191 400	-	564 200	563 600	**249**	**0,731**
Novogrodovka	17,1	5,5	7 608	1 978	0		7 608	11 000	**260**	**0,445**
Selidovo	60,9	108,2	33 810	8 711	4 308	6 070	44 188	23 000	**258**	**0,555**
Slaviansk	145,2	74,2	70 875	17 850	10 651	61 531	143 057	81 900	**252**	**0,488**
Snejnoye	80,5	188,8	6 440	1 610	13 624	2 987	23 051	22 000	**250**	**0,080**
Torez	93,1	104,8	27 423	9 324	31 184	11 032	69 639	50 200	**340**	**0,295**

	Population 01/01/03 x 1000	Surface km²	Volumes of SHW collected in 2002						Density of SHW kg/m³	Volume of SHW per capita (residential sector) m³/year
			Residential sector m³	tons	Commercial waste (except for residential sector) m³	Municipal waste m³	Total m³	Data of Dept of Housing and Public Utility Services m³		
Ugledar	16,9	5,3	9 793	2 448	4 403	1 025	15 222	17 800	**250**	**0,579**
Khartsizsk	112,3	206,9	65 305	13 626	28 329	3 459	97 093	53 900	**209**	**0,582**
Shahtersk	69,7	51,0	14 610	3 652	36 962	1 629	53 201	31 900	**250**	**0,210**
Yasinovataya	37,2	19,2	50 710	11 156	14 056	1 991	66 757	64 800	**220**	**1,363**
Districts (total)	**715,4**	**21 575,6**	**156 367**	**52 524**	**96 372**	**100 729**	**352 165**	**241 900**	**336**	**0,219**
Alexandrovskiy D.	22,5	1 010,1	8 400	2 100	1 150	1 200	10 750	3 300	**250**	**0,373**
Amvrosievskiy D.	54,0	1 455,5	12 401	5 500	3 052	779	16 232	14 700	**444**	**0,230**
Artemovskiy D.	52,6	1 686,8	16 841	1 835	4 236	2 628	23 704	2 200	**109**	**0,320**
Velikonovoselkovskiy D.	48,5	1 901,3	10 400	2 600	0	1 000	11 400	2 000	**250**	**0,214**
Volnovahskiy D.	91,8	1 848,2	31 282	25 040	38 400	28 200	97 882	44 200	**800**	**0,341**
Volodarskiy D.	30,9	1 221,5	2 159	540	123		2 282	25 600	**250**	**0,070**
Dobropolskiy D.	20,2	949,3	1 800	900	0	1 300	3 100	1 800	**500**	**0,089**
Konstantinovskiy D.	20,5	1 171,7	1 106	277	0	13	1 119	600	**250**	**0,054**
Krasnoarmmeyskiy D.	36,8	1 315,7	8 800	2 200	2 000	4 320	15 120	1 200	**250**	**0,239**
Marinskiy D.	89,1	1 350,4	33 813	3 519	40 707	57 000	131 519	86 300	**104**	**0,379**
Novoazovskiy D.	38,6	1 000,4	3 750	1 125	1 036		4 786	2 700	**300**	**0,097**
Pershotravneviy D.	28,8	792,1	7 148	1 787	2 496	303	9 947	29 900	**250**	**0,248**
Slavianskiy D.	38,4	1 273,7	3 500	875	0	2 036	5 536	1 500	**250**	**0,091**
Starobeshevskiy D.	55,3	1 254,9	10 002	2 501	2 838	1 800	14 639	17 800	**250**	**0,181**
Telmanovskiy D.	34,4	1 340,1	2 600	600	0		2 600	2 700	**231**	**0,076**
Shahterskiy D.	23,2	1 194,4	1 065	800	334	150	1 549	4 100	**751**	**0,046**
Yasinovatskiy D.	29,8	809,5	1 300	325	-	-	0	1 300	**250**	**0,044**
"Official Data"									**250**	

Table 1: SHW known production per Administrative Unit (2002)

N° Plant	Characteristics of waste (name, code by the classifier of waste, group, danger class)								Total volume of waste generated (by danger classes), tons/year	Total Index of Waste Generation (TIWG)
	Name	Code Classificator	Class of Hazard	Group of Waste	Code Group	Type of Hazard	Type of Waste	State		
3	Used oils	6000.2.8.10	1	Petroleum waste	1.12.00	H8	Organical	Liquid	0	1 000
1	Tubes Fluo	7710.3.1.26	1	Waste with mercury	1.19.00	H8	Inorganic	Solid	20 pces	
2	Tubes Fluo	7710.3.1.26	1	Waste with mercury	1.19.00	H8	Inorganic	Solid	229 pces	
5	Tubes Fluo	7710.3.1.26	1	Waste with mercury	1.19.00	H8	Inorganic	Solid	136 pces	
3	Tubes Fluo	7710.3.1.26	1	Waste with mercury	1.19.00	H8	Mix	Solid	355 pces	
6	Tubes Fluo	7710.3.1.26	1	Waste with mercury	0.19.00	H8	Mineral	Solid	0	3
								TOTAL	0,5 ?	t/year
1	Used oils	6000.2.8.10	2	Petroleum waste	1.12.00	H8	Organical	Liquid	3	1 500
2	Used oils	6000.2.8.10	2	Petroleum waste	1.12.00	H8	Organical	Liquid	4	2 143
4	Used oils	6000.2.8.10	2	Petroleum waste	1.12.00	H8	Organical	Liquid	1	400
5	Used oils	6000.2.8.10	2	Petroleum waste	1.12.00	H8	Organical	Liquid	0	200
6	Used oils	6000.2.8.10	2	Petroleum waste	1.12.00	H8	Organical	Liquid	3	1 500
2	Lead Accumulator	6000.2.9.04	2	Waste with lead	1.16.00	H8	Inorganic	Mixte	0	170
5	Lead Accumulator	6000.2.9.04	2	Waste with lead	1.16.00	H8	Inorganic	Mixte		
1	Lead Accumulator	6000.2.9.04	2	Waste with lead	1.16.00	H8	Inorganic	Solid	0	75
4	Lead Accumulator	6000.2.9.04	2	Waste with lead	1.16.00	H8	Inorganic	Solid	0	25
6	Lead Accumulator	6000.2.9.04	2	Waste with lead	1.16.00	H8	Inorganic	Solid		
3	Lead Accumulator	6000.2.9.04	2	Waste with lead	1.16.00	H8	Mix	Solid	0	100
								TOTAL	12	t/year
4	Limestone	1412.2.8.00	4				Mineral	Solid	196	196
3	Cattle cake	1532.2.9.02	4				Organical	Paste	1 332	1 332
3	Balles	1541.2.9.02	4				Organical	Solid	4 075	4 075
3	Residue of refining	1542.2.9.01	4				Organical	Liquid	110	110
3	Clays of filtration	1542.2.9.02	4				Organical	Paste	23	23
3	Powder of filtration	1542.2.9.02	4				Organical		21	21
3	Residue of oil filtration	1542.2.9.03	4				Organical	Liquid	29	29

5	Pulp of beet-root	1583.2.9.01	4				Organical	Mixte	106 666	106 666
5	Sludge of washing	1583.2.9.03	4				Mixte	Mixte	12 500	12 500
6	Sludge of washing	1583.2.9.03	4				Mixte	Solid	18 000	18 000
5	Treacles	1583.3.1.04	4				Mix	Paste	6 300	6 300
4	Wood	2000.2.2.01	4				Mix	Solid		
1	Wood	2000.2.2.01	4				Organical	Solid	229	229
6	Wood	2000.2.2.01	4				Organical	Solid		
5	Wood	2000.2.2.09	4				Mixte	Solid	12	12
2	Wood	2000.2.2.09	4				Organical	Solid	4	4
1	Broken bricks	2640.2.9.02	4				Mineral	Solid	2 690	2 690
2	Sludge of power plant	4010.2.8.01	4				Inorganic	Solid	3	3
3	Tyres	6000.2.9.03	4				Mix	Solid	1	1
4	Tyres	6000.2.9.03	4				Mix	Solid	2	2
1	Tyres	6000.2.9.03	4				Mixte	Solid	1	1
2	Tyres	6000.2.9.03	4				Mixte	Solid	3	3
5	Tyres	6000.2.9.03	4				Mixte	Solid		
1	Black metal	7710.3.1.08	4				Inorganic	Solid	38	38
2	Black metal	7710.3.1.08	4				Inorganic	Solid	14	14
3	Black metal	7710.3.1.08	4				Inorganic	Solid	44	44
4	Black metal	7710.3.1.08	4				Inorganic	Solid	30	30
5	Black metal	7710.3.1.08	4				Inorganic	Solid	11	11
6	Black metal	7710.3.1.08	4				Inorganic	Solid	98	98
5	Non ferrous metal	7710.3.1.08	4				Inorganic	Solid		
6	Non ferrous metal	7710.3.1.08	4				Inorganic	Solid		
3	Common Waste	7720.3.1.01	4				Mix	Solid	127	127
4	Common Waste	7720.3.1.01	4				Mix	Solid	2	2
6	Common Waste	7720.3.1.01	4				Mix	Solid	5	5
2	Common Waste	7720.3.1.01	4				Mixte	Solid	114	114
5	Common Waste	7720.3.1.01	4				Mixte	Solid	33	33
2	Sludge	9030.2.9.05	4				Mixte	Paste	18 038	18 038
								TOTAL	170 749	t/year

Table 2: data from the Registration Cards in Chernivtsi Oblast

4.1.3.4 Methodology

Passports

The oblast comprises XXX registered enterprises. YYY of them are submitted to the obligation of the passportisation of their waste.

The data of the passports include:

- Name, ID code by the USREOU
- Subordination Code by the SNPAA
- Address, (settlement, rayon) by the COATDU
- Property type, code by the CPT
- Characteristics of waste (name, code by the classifier of waste, group, danger class)
- Total volume of waste generated (by danger classes), tones/year
- Total Index of Waste Generation (TIWG)

The TIWG is calculated by the formula:

$$TWGI = 5000 * m_1 + 500 * m_2 + 50 * m_3 + 1 * m_4$$

where m_1, m_2, m_3 and m_4 are the quantities of waste produced in each of the four danger classes (classes 1, 2, 3 and 4, respectively).

The passports must be established by all the companies whose the TWGI is more than 1000 t/y.

Besides some general information can be found from local administration and the passports of the waste facilities:

- Collection & disposal of *household waste from non-housing sector* (companies, institutions) on contractual basis
- Volumes of household waste collected and disposed *by request of municipal administration* (without contract, paid from local budget)
- Silt, sludge and residues from treatment facilities
- Characteristics of the transportation fleet
- Waste treatment facilities
- Recycling options
- Investment needs
- Dump sites / landfills

Quality of the information

The data about SIW production are representative and not exhaustive. The passports are a very good mine of information but it's applied only under the condition of a minimal annual production of waste, in fact for facilities producing more than 1000 t/y of " Total Index of Waste Generation ".

Critical analysis

As long as, on one hand, the question of the nomenclature of waste is not solved and fully applied on the field in every administrations, and on the other hand, the quantities are not expressed in tons and metered by a sufficient park of weighbridges, the figures collected from the different administrations, authorities, enterprises, must be considered as suspect.

A first objective for a first plan is to dispose of figures which are realistic at ± 5%. It's enough for the first set of decisions which are to be taken. But the collected data must be analysed and criticised in aim to be sure they are liable at ± 5%.

Field studies on waste composition

A particular attention must be paid on the knowledge of the composition of the waste. Within the passportisation, the composition of the waste is declared by its producer. It's necessary that the administration has the means to counter-analyse and counter weight the waste. It requires laboratories and norms. In Western Europe this charges are invoiced to the producer of waste. It requires a particular regulation in Ukraine.

4.1.3.5 Remarks about Waste from Shops and small Producers

The production of common waste of the SME (to use the European terminology) is normally known by the contracts they are obliged to pass with the local utilities, public or private. As seen previously, the Department of Housing and Communal Services can provide figures.

One question still remain: the production of hazardous waste by these SME. A particular study on the field should provide an assessment of this production.

4.1.4 Status of Collection

The status of the collection must be separate between the common industrial waste and the hazardous waste.

4.1.4.1 Common Industrial Waste

The local authorities are in charge of the waste collection, the transportation and the disposal. They are financed by the contracts they pass with the individuals as the companies.

The municipal enterprises cannot ensure a correct development of their equipments (trucks, containers, …) for the reason of insufficient finance means. The system of the contracts with the individuals oblige these enterprises to do by themselves the recovery and it can happen that the rate of non payment (or of non contraction) reach more than 50% in some cases. In other respects, too high interest rates forbid these enterprises to help with bank loans in aim to make the necessary investments.

Their means are globally in a bad state. With the Questionnaire in Donetsk Oblast, we have got an inventory showing a park in good state covering only 25-30 % of the production of waste.

4.1.4.2 Hazardous waste

Normally it requires specific trucks and packaging. It's not clear at all that neither the regulation is complete and cohesive on this subject, neither it exists on the market this equipments inside the producers of hazardous waste or as service and transportation companies.

At least, an inventory of the needs should be drawn up.

4.1.4.3 Dumpsites in the yard

It's a common practice inherited of the past. A lot of facilities have accumulated a dump of waste in their backyard or in the nature.

A particular objective for the Inspection is to progressively draw up an inventory of these dumpsites.

4.1.4.4 Recycling and re-use

It's principally about the metal and the cardboard, whose the sorting is easy in the plants.

An inquiry should provide some figures.

4.1.4.5 Rubble

The rubble and other inert waste disposed at dumps don't put any environmental or sanitary problem. The problem is principally their transport unto a storage site, which doesn't require, in comparison with the extent of the problems about the *stricto sensu* industrial waste, any particular monitoring.

4.1.5 Status of the Waste Disposal

4.1.5.1 Functioning of the landfills

The local authorities of cities and rayons manage a lot of SHW (& SIW) dumps/landfills (including the dumps of village councils). Many of them have already exhausted their capacities, others will be full in the short-term perspective as the ones which have already been operated for 20 to 50 years.

The passports for waste disposal sites allowing to include a dump into the regional inventory of waste disposal sites have been developed only for a part dumps.

As a rule, the facilities used for SHW and/or SIW disposal have not been constructed as technical structures in accordance with design documentation, that's why they do not have a geomembrane and are not properly equipped. Many of them do not have documents confirming the right for using the land. As the existing dumps do not meet sanitary and ecological requirements the State Department of Ecology provides permits for disposal of waste only at a few SHW dumps/landfills annually.

Usually a visual control takes place at the entrance of the dump. The disposal of waste, delivered at the dump by other companies (self-collection) is done on a commercial basis. As a rule, there is used a voucher system (for disposal of a certain volume of waste one is to buy vouchers which are to be submitted upon delivery of waste to a dump).

Normally, the dumps belong to public utilities engaged in waste treatment activities. However, there have been registered few cases when such facilities have been transferred to private companies.

At almost all of the landfills, starting from a certain size, certain categories of low-income citizens are very active in sorting secondary raw materials. Such activities take place in an unauthorised way within extremely anti-sanitary and unsafe conditions. The fires are a usual practice.

4.1.5.2 Dumpsites

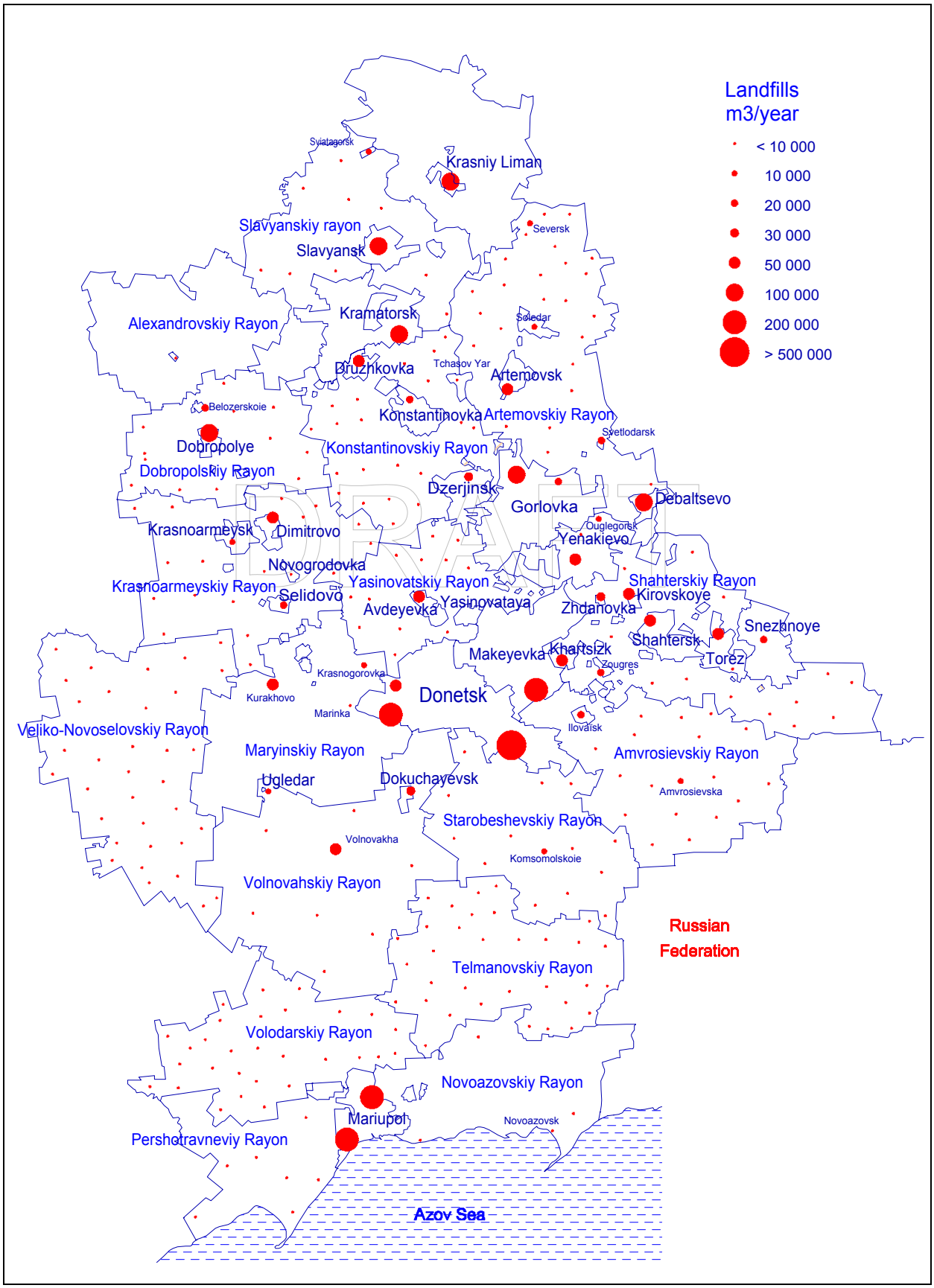
Hundreds sites of wild dumping exist within each Oblast. It put a problem both environmental and sanitary, in the measure these dumpsites are made without any caution and bring a diffuse pollution all over the territory. This pollution is mainly done by infiltration. Otherwise, these dumpsites are often only covered of soil instead of cleansed.

Liquidation of unauthorised dumps is within the competence of local self-government bodies. This kind of activities are organised in cities and rayons of the Oblast on the annual basis, especially in spring.

4.1.5.3 Existing landfills

As done in Donetsk, the answers that could be extracted from the Questionnaire sent to the administrative units were incomplete. Nevertheless they have the merit to exist and they are reproduced on the *Map 1 Landfills used by administrative units* on which the landfills are put on according to the yearly volume of disposed household waste.

The less that can be said is that there's an atomisation of the landfills. It's typically the situation of past practices. Each one is putting the waste in the closest hole. Unfortunately such an approach is still in use.



Map 1 Landfills used by administrative units

Environment risks

The most immediate risk is about the fires (garden fires, village fires, landfill fires). The burning of complex mix as household and industrial waste (if not hazardous waste as it can be seen on a lot of landfills) such produces a lot of toxics: hydrochloric acid, volatile organic compounds, dioxins, etc. The dioxins, notably, are extremely carcinogenic, non biodegradable, and accumulate at the summit of the food chain.

In other respects, the disposed waste contain toxic waste (solvent, batteries, etc.), whose the combustion provokes too a dispersion of heavy metals and other toxic molecules.

The leaching off of the landfill by the rain put also a major environmental problem, in the measure the leachates are not managed: then they are the vector of the contamination of the surface water by run off and/or of the watertable by infiltration.

Health risks

These pollutions caused by the landfills migrate mainly in water. In a lot of cases, it contaminates the intake of the water supply and the drink-water facilities are unable to eliminate such chemical pollutants. It makes to run important sanitary risks to the population. A study done by the Ministry of Environment of the Russian Federation in 1994 assessed that it was the cause of 87 000 deceases per year within the territory, mainly in babies and old people, and at least the same amount of congenital malformations.

Out of evident human considerations, it must be considered the amount of the huge public expenses that could represent in mid and long term the management of the sanitary consequences of the lack of the on going taking into account of the problem.

4.1.5.4 Inventory of Existing Landfill Sites

Two objectives

It exists a lot of landfills and dumpsites over the territory of the Oblast, known or forgotten, able to impact environment and human health. In aim to manage this problem with the today and short term available means, the strategy is to define a 3 levels risk assessment method, whose objectives are:

- Level 1: to determine within an half-day or a one day if a landfill is potentially dangerous
- Level 2: to determine the potential of danger of a landfill and the emergency degree for a securization
- Level 3: to determine the measures to be taken

An other objective is to determine the landfills which can be reasonably kept in exploitation for some time. A Regional Plan of Sanitary Landfills (see further) will need something like ten years to be implemented. So, during the interval, it's better to select the existing landfills offering the best conditions of safety and to dispose in them all the household waste.

So the audit of the existing landfills uses two grids of scoring: one for the risk assessment, the other for the interest of exploitation.

Methodology

A methodology has been developed, implemented and reported in Donetsk Oblast in the frame of the Tacis Programme: Improvement of the SHWM. It can be referred to the specific report.

4.1.6 Status of the Sorting Solutions

A study must draw up the inventory of the facilities able to take sorted waste as secondary raw materials.

The activities concerned with collection and preparation of certain types of waste as secondary raw material are subject to licensing in accordance with the laws of Ukraine “On Licensing” and “On Waste”. Licenses are given by the Ministry of Ecology and Natural Resources of Ukraine. By today some companies and private entrepreneurs have licenses for this type of activity. Among them there are large and branched companies as UkrEkoKomResurcy, whose the role on this market should be more clearly defined.

4.1.7 Financing management of waste

A tariff system includes several components:

- The general framework of the tariff;
- The organization of the relationships between the collector and the customer (usually under a contractual form);
- The modes of calculation of the invoice;
- The modes of recovery;
- The administrative organization for the execution of these functions.

We can speak only of the payment for the disposal of the common industrial waste because we have no data about the disposal of hazardous waste. This part of the problem should be studied.

4.1.7.1 Description of the existing system

The existing system of tariff and payment for the household waste disposal is built upon three major principles. These principles, which may have an implicit character, fund the finance relationships between the City, the Collector and the Consumers:

1. *direct payments* – the consumer or his representative pays directly to the company for waste collection services;

2. billing for service delivery based on the factual volumes of waste collected, expressed in m^3;

3. or billing for service delivery based on SIW accumulation norms established by local authorities in m^3.

Analyse

For historical reasons bound to the crisis of non-payment (wages and bills), the system of tariff and payment of the disposal of household waste became by the same **complex** and **inefficient**.

The on going bad functioning of the system is the consequence of the incoherence or the inefficiency of these principles or their application.

It may be noticed that the system is supposed to respect the polluter-payer principle but it transforms in non-payer-polluter.

By practice, the relationships are done in fact essentially between the customers and the collectors. By the fact, the City doesn’t intervene in the tariff if not on only three points:

- Definition of tariffs used by the public utility responsible for waste disposal : price per m^3 of collected waste and m^3 of waste disposed at the landfill (for residential buildings and budget organizations)
- Definition of regulated volumes (norms of household waste accumulation in m^3 per year per person for residential sector and for other facilities per calculated unit), on the basis of which there are calculated the tariffs for inhabitants of the private sector.
- Approval of a type-contract.

Direct payment

The payment of the service is directly done from the consumer to the collector, out of that the City or any administrative structure help as intermediary. The direct payment is an ancient tradition, going back to the communist period.

It must be distinguished three cases:

- Collective housing;
- Private sector;
- Enterprises and other organizations.

The direct payment takes two aspects:

- For the private sector and the enterprises, payment by the consumer to the collector by a money transfer in the hands of the Spare Bank ("Ochadny Bank");
- For the collective housing sector, the system includes two stairs: payment of the charges by the inhabitants to the JEK, then payment by the JEK to the collector.

4.1.7.2 Recovery

Enterprises

Budget organizations and institutions pay for waste collection services by contract based on factual volumes and in accordance with the tariff established by City authorities. The procedures for definition of the volumes of waste are the same as the ones used by JEKs. For non-budget companies a public utility can fix higher tariffs than the ones used for JEKs, however, the profit margin cannot exceed 20%.

It should be noted that many companies collect household and common industrial waste by themselves paying only for waste disposal at the landfill.

There is no control of the factual contents of containers. That means it is not possible to identify hazardous waste which can be among the waste of companies, and they can be only revealed during the disposal at the landfill.

4.2 Working out Several Variants Fulfilling the Objectives

An important part of the job of the Plan is to establish and to compare several scenarios of the waste production and the waste disposal.

The existing facilities of waste disposal must be inventoried within the territory but also in the neighbour oblasts, and sometime at the national scale. The mind is that a facility treating a family of hazardous waste is sized for a bracket of tonnage per year and this tonnage is not necessarily available within the territory of one oblast.

This part must be presented as the following plan. The Description of the Main Variants is properly the description of several scenarios, with their advantages and their drawbacks.

4.2.1 Presentation of Technologies Currently Available

4.2.2 Analysis of the Local Opportunities and Requirements

4.2.3 Evaluation of the Outlets for Recycling Materials

4.2.4 Planning Evolution of the Waste Categories

4.2.5 Description of the Main Variants

4.3 Choice of the Plan

4.3.1 Choice of the Variant

Among the previous scenarios, one must be chosen. This part must justify the choice.

4.3.2 Organisation of the Management

4.3.3 Waste Flows Schemes

4.3.4 Quantitative Targets

4.3.5 Description of Changes in Organisation

4.3.5.1 Reform of Waste Operation and Management Structures

4.3.5.2 Reduction of the Flows at Regional Level

4.3.5.3 Reduction of the Flows at Facility Level

4.3.6 Recycling Solutions

4.3.6.1 Metals

4.3.6.2 Packaging

4.3.6.3 Other Recycled Waste

Usually it's economically affordable to refine used oils and solvents. The relevant facilities are cheap to build and easy to operate. It may be a priority for the implementation of hazardous waste treatment facilities.

4.3.6.4 Compost Solutions

We have not yet tackled the question of the food industry. In a lot of cases, the organic waste can be valued by composting or similar biological technologies. They must not be forgotten.

4.3.7 Ultimate Waste

The notion of ultimate waste is a temporary notion: not valuable within the today's conditions. We could add "not disposable" within the today's conditions.

According to that, two ways must be explored: the landfilling of the "not valuable" waste and the temporary storage of the "not disposable" waste.

4.3.7.1 Landfilling of the "not valuable" waste

Optimisation of the Location of the Landfill Site

Programme to Upgrade Existing Landfill Sites

Programme to Raise Technical Levels of Landfill Operations

Programme to Raise Technical Levels of Landfill Design

Plan to Suppress Illegal Tipping

4.3.7.2 Temporary storage of the "not disposable" waste

A lot of hazardous waste require high technology and so, high cost operations. These facilities don't exist today in Ukraine. It stays that there's an emergency to insulate these waste from the environment. A priority should be done to create a facility of temporary storage of these waste. The waste should be identified and inventoried and then stored in specific rows in such a manner to avoid any risk of chemical reactions between us and with the climate conditions.

When the relevant facilities will be built (it means that the relevant costs should become affordable for the industry), the waste should be treated in good conditions. The mechanism of payment provision by the producer for the temporary storage and the final treatment should be carefully studied.

4.3.8 Energetic/Energy Solutions

The incineration with heat recovery and/or electricity conversion is very seducing for the waste disposal. It must be kept in mind that the waste are usually very complex materials including toxic molecules, toxic metals. So the incineration of waste is universally submitted to strict regulations about the emissions in atmosphere. For the toxic waste, in most cases, there's not any heat recovery because the best way to avoid the production of dioxins is to below roughly the temperature of the gas from 1200 °C to 95 °C with a quench.

4.3.8.1 Incineration with Heat Recovery

The only one available solution seems to be for the moment the cement plants. It's very often used in Western Europe. It is admitted that the alkaline properties of the middle of the cement furnace eliminate some pollutants as acids and fix some pollutants as metals. So it's not asked to implement a specific treatment of the smoke but it requires a strict control of the waste to be burnt because: a) some pollutants are not eliminated by the process; b) some pollutants are not compatible with the quality of the cement as chlorine and copper.

The advantages are a full recovery of the energy of the waste and a low cost of treatment.

4.3.8.2 Incineration without Heat Recovery

4.3.9 Transport

It exists international regulation on the transportation of hazardous goods as the Hamburg Convention and the regulation of the UN. The transportation of hazardous waste must respect the Ukrainian regulation (if not the international regulations) on the transportation of hazardous goods.

It will be difficult to find private transportation companies equipped for all kind of hazardous waste. The Plan must look into this question.

4.3.10 Impacts on Local Economy

The waste disposal is an economical activity and it creates jobs. The Plan will have an impact on the regional economy and it's good to valuate this impact.

4.3.11 Implementation of the Plan

It's a main difficulty. Somewhere in the minds it's supposed that the disposal of the industrial waste is a free market between private producers of industrial waste and private companies of waste transportation and disposal. What should an administrative plan regulate a free market ?

The plan inventories the existing possibilities of waste disposal. The public power can then enforce the producers to use the existing facilities.

The plan demonstrates which facilities are needed and sizes them. The question stays how to push the investment in these new facilities.

4.3.12 Time schedule

It's good to detail an action programme for each one of the five years of the Plan. So year by year the Plan will precise what we'll be done for:

- the collection and the improvement of the data;
- the level of the fees for the disposal of the categories of waste;
- the improvement of the collection of the waste with objectives of rate of collected tons by category;
- the implementation of the main projects.

An economical assessment of these decisions will be detailed year by year.

4.4 Plan Follow-up

This part must describe concretely the PWO, beginning by the authority in charge of the PWO structure: recruitments, wages, means, charges, …

5 Detailed programme of the first phase

5.1 Implementation Plan for the First Year

Usually for the first year of implementation of the Plan, the main activities are focused on the quality of the figures, as:

- systematic implementation of weighbridges;
- computerization of the passports;
- creation of the database and if possible of the geodatabase;
- business plans of the new facilities;
- finance engineering for the funding of the investments;
- put at level of the control laboratories.

These actions are under the control of the Administration. They are not too much expensive. They allow to dispose of a strong base for the following steps.

5.2 Mass-Media Campaign

The public awareness is essential. But in this case, the main "public" is the industrial companies and the employees of the companies. A particular attention must be paid to the training of these people to the elements of the hazardous waste management.

5.3 Regulatory/Regulation Issues

In parallel, it is expected that some regulations will be updated or created as soon as possible. The Plan must be linked to the evolution of the regulation.

5.4 Recommendations for Dissemination

The plan must be known by the users. It must be printed and largely disseminated in the enterprises, the administrations, the local authorities, the unions, and so. A phone number may be put at the disposal of the professionals to find an answer to their questions. All the material must be available on a website.

A key-point is the confidentiality. A lot of enterprises are in an illegal situation in terms of emission of pollution. They need some advices when they begin to study the way to remedy their situation. If they ask for advice, they don't ask for fine. The game rules must be clear in this domain. They must get advices in the strictest confidentiality. The Inspection must admit that.

6 Recommendations

Some necessary improvements of the Ukrainian regulation appeared during this study. They are underlined in this part. It was not asked to make a particular study of the Ukrainian regulation and we cannot pretend to have been exhaustive in our knowledge of the Ukrainian regulation. Nevertheless we can presume that these points must be improved.

6.1.1 Framework of the Regional SIW Management Strategic Plan

This report proposes a methodology and practices for the elaboration of the Plan. After an experimentation on the field, in one or some oblasts, a regulation should detail the legal framework of the Plan: lawful validity of the Plan, entities having to endorse the Plan, authority deciding the Plan, role and functioning of the Commission of the Plan, sources of financing of the work of the Plan and further of the PWO, and so.

A particular point is to clarify the powers, responsibilities and roles of the Regional Administration, the Regional Council, the Department of Ecology.

6.1.2 Definition of the industrial waste

It appears in the Ukrainian regulation the notions of "waste" and of "household waste". The waste of the industry, the agriculture, the trade activities; the inert waste, the common waste, the hazardous waste are not clearly defined. All these definitions must lay on clear and measurable criteria.

6.1.3 Inventory of the landfills

This inventory is an obligation by the Resolution 1998-1216. The Tacis Programme of Donetsk has developed a methodology for this inventory. It could be generalized by a technical instruction to the local Inspectorates, which supposes to equip all the Inspectorates with the relevant means.

6.1.4 Approved technologies

One main problem in Ukraine is that the law defines an obligation for the producers to dispose their waste is regulated conditions, and an obligation to apply waste management planning. Nothing defines the appropriate technologies to be used for each waste, the appropriate means, the control of the relevant facilities. In fact, it seems it is supposed that the market will generate spontaneously the facilities for all species of hazardous waste and that everybody will use them !

Based on the French experience, the IPPC facilities are classified by a nomenclature. For number of the items of the nomenclature it exists an order-type defining the conditions of the operations for such facilities.

In aim to prepare the administration to the implementation of new facilities for the waste disposal, and particularly for the hazardous waste, it should be useful that the Ministry works on and publishes instructions on the characteristics of the technologies applicable to the waste disposal.

6.1.5 Consultation of the public

The “Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC” should inspire an Ukrainian regulation about the expression of the public opinion on the projects and the existing facilities which can impact the environment.

This regulation must be progressive. To express an opinion, the public must be trained and it will require some steps. It’s not realistic to copy the French way (or the German or of any other country).

Nevertheless, it must be organized a first level of a transparent information of the public and a way to collect the opinions.

6.1.6 Transportation of the hazardous waste

All we have found is a draft of a law ON HIGHLY DANGEROUS OBJECTS but in its article 2 it's said:

This Law does not apply to the following:

- *Railway, sea, river, automobile and air transport;*
- *Waste accumulation polygons.*

A regulation of the transportation of the hazardous waste is necessary. It must be done in accordance with the international regulations as the Hamburg Convention and the model regulation of the UN (13th edition).

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The consultant is the consortium

BRGM
3, avenue Claude-Guillemin - BP 6009 - 45060 Orléans Cedex 2 - France

ADEME
27 rue Louis Vicat – 75737 PARIS CEDEX 15 - France