Philipp Engewald

Strengthening regional waste management in Macedonia

Final project report
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waste management

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Umwelt Bundes Amt
for our Environment

BEF GERMANY

Final Project Report: Strengthening regional waste management in Macedonia

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The project was carried out with financial support of the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety and the Federal Environment Agency (Umweltbundesamt) in the frame of the Advisory Assistance Programme for Environmental Protection in the Countries of Central and Eastern Europe, the Caucasus and Central Asia.

Reference number: Fkz 380 01 225

Authors:
Philipp Engewald
philipp.engewald@bef-de.org

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The document “Organizational and management recommendations for future regional waste management in Macedonia” is a separate part of this report and available in English and Macedonian.

List of Abbreviations

BEF	Baltic Environmental Forum
BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (*Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit*)
DST	German Association of Cities and Towns (*Deutscher Städtetag*)
EU	European Union
IPA	Instrument for Pre-accession Assistance
LASUA	Latvian Association of Waste Management Companies (*Latvijas atkritumu saimniecības uzņēmumu asociācija*)
NWSRM	National Waste Strategy of the Republic of Macedonia
PPP	Public-private partnership
REC	Regional Environmental Center for Central and Eastern Europe
RWMP	Regional Waste Management Plan
UBA	Federal Environment Agency (*Umweltbundesamt*)
ZAAO	North Vidzeme Regional Waste Management Organization (*Ziemeļvidzemes atkritumu apsaimniekošanas organizācija*)

1 Summary

This chapter contains a summary in German, Macedonian, and English.

1.1 Zusammenfassung

Wie in vielen Mitgliedstaaten der Europäischen Union liegt auch in der ehemaligen jugoslawischen Republik Mazedonien die Verantwortlichkeit der kommunalen Abfallwirtschaft bei den lokalen Behörden. Im Rahmen des Anpassungsprozesses an den Umweltacquis der Europäischen Union und der nationalen Abfallwirtschaftsstrategie ist die Errichtung regionaler Körperschaften vorgesehen, um die Kommunen zu unterstützen und anstehende organisatorische und investive Maßnahmen effektiver und effizienter umsetzen zu können. Kommunen in Mazedonien begegnen einer solchen regionalen Zusammenarbeit derzeit jedoch mit Unsicherheit. Außerdem hat das mazedonische Umweltministerium für den ersten Schritt die Errichtung einer regionalen Deponie in Form einer Public-Private-Partnership vorgegeben. Offene Fragen betreffen daher unter anderem Erfahrungen mit Public-Private-Partnership-Modellen und die Sicherstellung eines umweltfreundlichen Abfallwirtschaftsystems unter diesen Bedingungen.

Ein Vorgängerprojekt zur Unterstützung der kommunalen Selbstverwaltung in Kroatien und Mazedonien bei der Anwendung europäischer Umweltgesetzgebung gab Anstoß für eine mazedonisch-lettische Zusammenarbeit, die die Errichtung regionaler Körperschaften für das Abfallmanagement als eine Herausforderung für mazedonische Kommunen identifizierte. Mit diesem Projekt sollte nun mazedonischen Akteuren die Möglichkeit gegeben werden, das Know How und die Erfahrungen des jungen EU-Mitglieds Lettland sowie deutscher Experten zu diesem Thema zu nutzen. Ein Lerneffekt ist gegeben, weil sich Lettland vor seinem EU-Beitritt ähnlichen Herausforderungen gegenüber sah. Der Fokus musste jedoch stark auf die zu Projektbeginn bereits unumkehrbar angelaufene Ausschreibung zur Errichtung und zum Betrieb der regionalen Deponie ausgerichtet werden.

Die Ziele des Projektes waren es, die mazedonischen Behörden bei der Errichtung eines regionalen Abfallwirtschaftssystems zu unterstützen, ihre Organisation und kosteneffiziente technologische Optionen zu diskutieren sowie den internationalen Informationsaustausch zwischen Experten aus Mazedonien, Deutschland und Lettland zu vertiefen. Recycling-Optionen wurden dabei ebenso besprochen wie Möglichkeiten der Abfallvermeidung. Zu diesem Zweck wurden in Mazedonien eine Arbeitsreise und ein Workshop durchgeführt, auf denen Vertreter der mazedonischen Kommunen und des Umweltministeriums mit den Experten aus der EU gemeinsam Vorschläge erarbeiteten, wie rechtliche und organisatorische Strukturen eines regionalen Abfallwirtschaftsystems in Mazedonien aussehen können. Außerdem wurde ein weiterer Workshop durch die mazedonischen Partner organisiert, um wesentliche Erkenntnisse des ersten Workshops breiter unter den Kommunen zu streuen. Unterstützt wurden die Projektpartner vom Deutschen Städtetag und der Vereinigung der Abfallwirtschaftsbetriebe Lettlands.

Die Empfehlungen zur Errichtung regionaler Abfallmanagementsysteme wurden mit dem Ziel der Übertragbarkeit auf ganz Mazedonien erarbeitet. Hinsichtlich der Errichtung einer Deponie mit Hilfe eines Public-Private-Partnership-Modells, wie von der mazedonischen Seite derzeit forciert, werden jedoch grundsätzliche Bedenken angemeldet. Eine Übertragung dieses Ansatzes in andere Regionen wird grundsätzlich nicht empfohlen.

1.2 Резиме

Како и во многу земји членки на Европската Унија, во Македонија (земја со кандидатски статус) локал-ната власт/општината е одговорна за управувањето со отпадот. Во процесот на усогласување на националното законодавство со Европското, акко и според националната стратегија за управување со отпад, се предвидуваат регионални тела за управување со отпадот. На тој начин локалната власт ќе има поддршка за поефикасно и поефективно организирање на активностите.

Меѓуопштинската соработка е сеуште нов поим за локалната администрација во Македонија, кадешто регионалното административно ниво сеуште не е воспоставено или пак е недоволно развиено, а при тоа има и многу отворени прашања, особено во однос на искуствата со моделите на јавно-приватно партнерство, како и околу создавањето на прифатлив систем за управување со отпад од аспект на животната средина преку овој вид на партнерство.

Во текот на спроведувањето на претходниот проект за поддршка на локалните власти во Хрватска и Македонија во поглед на градењето на капацитети поврзани со законодавството на ЕУ за животна средина, беше констатирано дека воспоставување на регионален систем за управување со отпад, претставува иден предизвик за македонската локална самоуправа.

Новиот проект ќе им даде можност на македонските експерти од областа на управувањето со отпад, да ги користат искуствата на Летонија, како една млада држава членка на ЕУ, како и да ги воочат придобивките од познавањето на германски колеги кои потекнуваат од локалната самоуправа..

Поддршка за Македонија во воспоставувањето на регионален систем за управување со отпад претставува главната цел на проектот. Во текот на две мисии во земјата, германски и летонски експерти ќе разговараат за финансиски одржливи технолошки и организациски можности, рециклирање, преработка и избегнување на создавањето на отпад, со што ќе се продлабочи размената на информации помеѓу експертите од три земји.

Преку мисиите, исто така, ќе се овозможи развој на низа организациски, технички и правни препораки за идниот регионален систем за управување со отпад. Партнерите во проектот добиваат дополни-телна поддршка од германската асоцијација на градови (Deutscher Städtetag) и летонското Здруже-ние на компании кои делуваат во областа на управувањето со отпад.

Препораките за поставување на регионален систем за управување со отпад се развиени со цел да бидат применливо на ниво на целата Македонија. Конкретно основањето регионална депонија во форма на јавно-приватно партнерство, е применливо за два региона и не може да се препорача за останатите региони во земјата.

1.3 Summary

Like in many other member states of the European Union, in the Former Yugoslav Republic of Macedonia, local authorities are responsible for the organization of waste management. In the frame of the approximation process for EU membership as well as the National Waste Management Strategy it is foreseen to establish regional waste management bodies to support local authorities to jointly manage the organizational tasks more efficiently and effectively. Inter-municipal cooperation is still new for local administrations in Macedonia, where an intermediate regional administrative level does not exist and there are many open questions particularly regarding experiences with public-private partnership models and regarding the establishment of an environmentally sound waste management system through this form of partnership.

A preceding project to support local authorities in Croatia and Macedonia in building capacities on EU environmental legislation identified the establishment of a regional waste management system as a future challenge for Macedonian local self-government. The intention of this follow-up project was to give Macedonian municipal waste experts the opportunity to make use of the knowledge and experiences of the young EU Member State Latvia as well as of German colleagues from local authorities. The focus of the project, however, had to be adjusted to the tendering procedure for establishing a landfill in form of a private-public-partnership model. This process had been initiated shortly before the project start.

Supporting Macedonia in establishing a regional waste management system was the overall objective of the project. During a field mission to the country and one workshop organized in the South East of Macedonia, German and Latvian experts discussed cost-efficient technological and organizational options, also regarding recycling, recovery and avoidance of waste and thus deepened the exchange of information between experts from the three countries. The development of a set of organizational, technical and legal recommendations for a future regional waste management system was also a part of the project activities. Towards the end of the project, another workshop was organized locally, where further details of the tendering process were discussed and where results of the first workshop could be spread further among the municipalities. The German Association of Cities and Towns (Deutscher Städtetag) and the Latvian Association of Waste Management Companies supported the project partners.

The recommendations for establishing a regional waste management system were developed with the intention to be applicable to the whole country. The establishment of a regional landfill in form of a private-public partnership, as currently happening in Macedonia, can however not be recommended.

2 Introduction

This report informs about the activities carried out within the project "Strengthening regional waste management in Macedonia" which was carried out between December, 2009 and August, 2010.

The project idea emerged out of a capacity building action in Macedonia on European environmental legislation for local self-government, which ended in July, 2009.[1] One of the focus topics of that project was European waste legislation and waste management from the perspective of local authorities in Macedonia. As the country does not formally have an intermediate regional political level, local authorities face more responsibilities than in many other countries with more administrative levels.

One of these challenges is the establishment of a modern regional waste management system. This project was initiated to contribute with the help of German and Latvian expertise to the establishment of such a regional system in Macedonia.

The activities were carried out with financial support of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Federal Environment Agency (Umweltbundesamt) in the frame of the Advisory Assistance Programme for Environmental Protection in the Countries of Central and Eastern Europe, the Caucasus and Central Asia.

On the following pages, the background and the activities carried out during the project are presented and evaluated.

2.1 Objectives

Overall project goal was to support the relevant authorities of the Republic of Macedonia in establishing a regional municipal waste management system.

The project had the following objectives:

- To share experience and knowledge from Germany and Latvia with regard to the enforcement of EU policy and requirements in the field of municipal waste management;
- To advise on organisational management issues in setting up the regional cooperation model among the local authorities on municipal waste management issues;
- To consult on actual technological issues and possible options related to municipal waste recycling and recovery issues;
- To strengthen the contacts among German, Macedonian and Latvian waste experts and managers.

[1] The project "Capacity-building on EU environmental legislation for local and regional self-government in Croatia and Macedonia" (Fkz 380 01 158) was carried out between February, 2007 and July, 2009 and was funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Federal Environment Agency (Umweltbundesamt) in the frame of the Advisory Assistance Programme for Environmental Protection in the Countries of Central and Eastern Europe, the Caucasus and Central Asia.. Further information about the project can be obtained from www.bef-de.org.

2.2 Results

- Through two regional workshops, German and Latvian experts provided information on their countries' experience in enforcing EU policy and requirements in the field of municipal waste management;
- Eventually, having participated in one field mission and one workshop in Macedonia, German and Latvian waste management experts advised on alternative options for setting up the regional waste management systems covering both, organisational and technological, aspects;
- Based on experiences from Germany and Latvia, organisational and management recommendations for cooperation and legal entity structures for a future regional waste management system were developed for Macedonia taking the South-East Region as example. Some of these recommendations are valid and applicable for the whole country and not only for selected regions.;
- During the meetings and communications closer contacts between Macedonian, German and Latvian waste experts and managers have been established for further cooperation

2.3 Project financing

The project was carried out with financial support of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Federal Environment Agency (Umweltbundesamt) in the frame of the Advisory Assistance Programme for Environmental Protection in the Countries of Central and Eastern Europe, the Caucasus and Central Asia. 78% of the total budget is financed from this source.

Table 1: Budget breakdown

Positions	EUR
A Personnel	36,000
B Travel	10,000
C Venues and Translations	8,2000
D Overheads	3794
TOTAL BUDGET	**57,994**

Fig. 1: Budget line shares

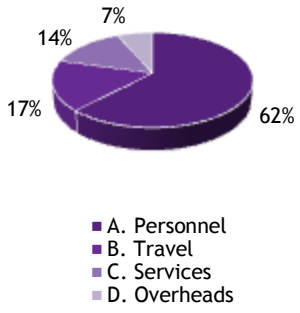
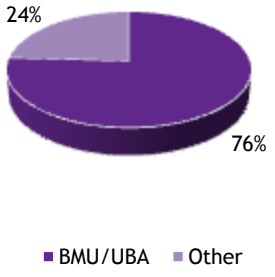


Table 2: Funding sources

Sources	EUR
BMU/UBA Grant	44,024
Other sources	13,970
TOTAL BUDGET	**57,994**

Fig. 2: Shares of funding sources



3 Background and Local Situation

The waste sector is presently one of the most crucial environmental issues to be solved in Macedonia. Currently, only the two largest cities, the capital Skopje[2] and Ohrid, in the South-West of the country, have a more advanced waste management system. Some form of organized waste collection and disposal is carried out in Macedonia mostly in urban areas, but the country often remains uncovered.[3]

The Government of Macedonia has adopted a new Law on Waste Management in 2004, which significantly contributed to the ongoing process of approximation[4] of the national legislation and provided an up-to-date and comprehensive framework for waste management based on EU Directives and guidelines on waste management. Besides mentioned Law, the broad national policy concerning waste management has been formulated within the National Waste Management Plan (2006-2012), the National Solid Waste Management Strategy, and the National Environmental Action Plan II. The Macedonian Ministry of Environment and Physical Planning is the public authority in charge for planning, overseeing and controlling the management of wastes. Organizing and financing waste management activities is in the responsibility of local authorities.[5] All these plans, strategies and activities are bundled in the National Waste Strategy.

The establishment of regional integrated waste management systems is a priority task for solving the currently inappropriate management of municipal wastes. Since Macedonia does not have regional political entities, waste management regions were established on the basis of the so-called statistical regions (cf. Fig. 3), which are used for comparisons of national statistics inside the country.[6]

The process of establishing a regional landfill system is based on the National Waste Strategy. Negotiations started in 2005 – and municipalities have so far not come to a solution. This information, however was unknown, when the project was applied and became known only during the field visit in February 2010. By law they are in charge of the whole waste management. However, there is a provision for the national level to force the establishment of 8 regional landfills. Land in Macedonia is owned by government (or private), so that is the “asset” with which the government can create pressure. There are currently three regions in Macedonia which foresee to establish a waste management system with a landfill on the basis of a public-private partnership (PPP): the South-East Region, with the centre Strumica, the Polog Region in North-West Macedonia (centre is Tetovo), and the South-West Region (centres are Ohrid and Struga). The South-East Region is the first where such a system will be established..

Currently there is pressure from the overall government on the Ministry of Environment and Physical Planning to successfully conclude the establishment of a first regional landfill by the end of 2010. In April 2010, a tender was issued by the Ministry of Environment to identify potential private companies that qualify to build and maintain a landfill in the South-East Region. Ad-

2 Skopje as such is not one municipality but consists of ten different municipalities. Altogether they constitute the capital of Macedonia.
3 Pre-feasibility Assessment of Options for Establishment of an Integrated Solid Waste Management System in the South-East Region, Macedonia, prepared by REC Country Office Macedonia and Pro-Consult, Skopje (October, 2008).
4 Since 17 December, 2005 Macedonia has the status of a Candidate for EU membership.
5 Cf. Pre-feasibility Assessment, p. 10.
6 Ibid.

ditionally, the closure of illegal dump-sites and the collection of waste is optionally included in the concession, depending on whether the successfully bidder has opted for it.

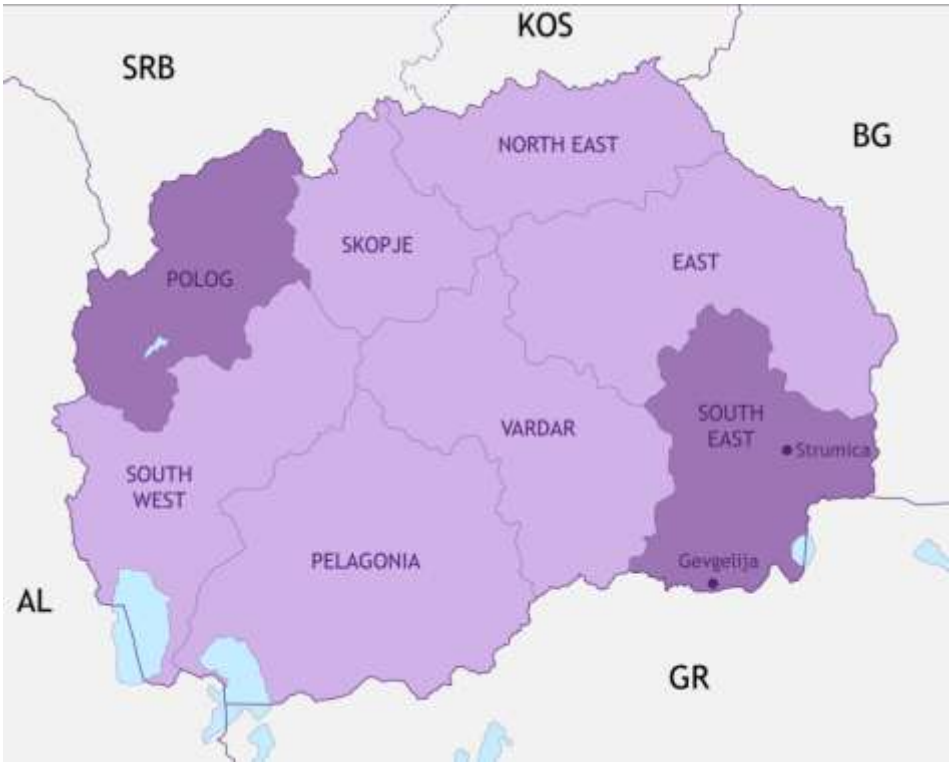


Fig. 3: Statistical regions in Macedonia. The South-East Region is the focus region of the project. The Polog Region will be the next region to carry out a tender for a regional landfill and has therefore been included in some of the activities.

Initially, this project of strengthening regional waste management planning was focusing on providing arguments for inter-municipal cooperation. With the enforcement of the Ohrid Agreement, signed in 2001 and ending the armed conflict between militant Albanian nationalists and Macedonian security forces, the regional level was abandoned and responsibilities were shared between the national and local levels. Municipalities have since been focused on managing their own affairs independently from the neighbouring municipality. By the time the project activities started, developments had advanced very rapidly, and the tendering process for the South-East Region was initiated. As the facts could not be ignored, the project focussed on advising on different options for setting up a regional landfill on the basis of a PPP model. It must be highlighted, however, that the project experts from the German, Latvian and Macedonian team are not considering this the most optimal solution, given the dependencies of municipalities towards the private investor, which has a commercial interest. This is why the project's results and recommendations are not to be considered a blueprint for other regions.

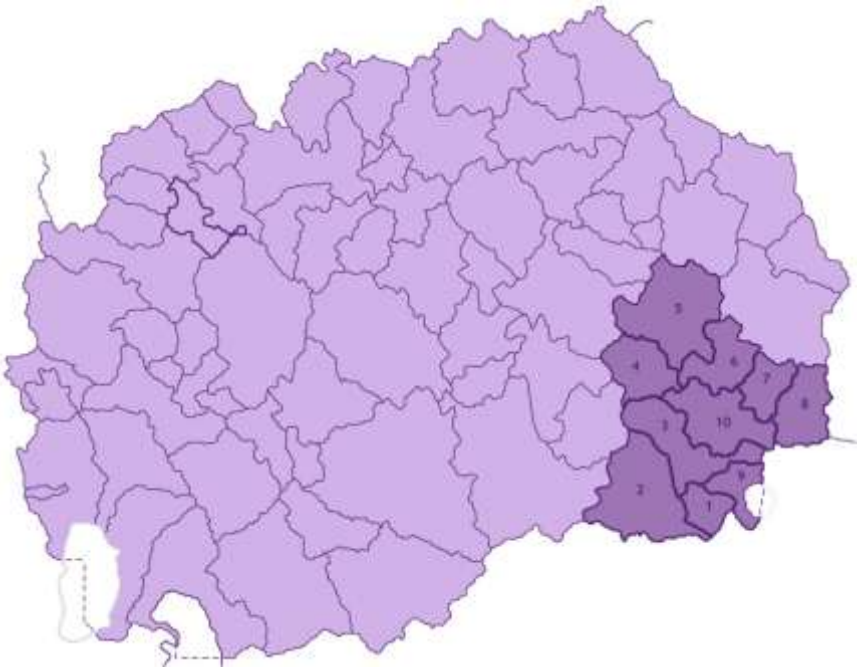


Fig. 4: Municipalities of Macedonia and the municipalities of the South-East Region are highlighted: [1] Bogdanci, [2] Gevgelija, [3] Valandovo, [4] Konče, [5] Radoviš, [6] Vasilevo, [7] Bosilovo, [8] Novo Selo, [9] Star Dojran, [10] Strumica

Building a landfill today is not anymore a preferable option, particularly looking at the discussion of the topic in Germany and the European Union (EU), where waste prevention, recycling and recovery solutions to save resources are preferred. Yet, the situation in Macedonia is very different. The German expert, Mark Lindert, Head of the waste management section in the City of Düsseldorf, after visiting the region, stated that skipping development stages will not be possible there. The present infrastructure and financial capacities would not allow establishing a sophisticated system of waste management that would strive for a maximum of recovery and recycling right away - a gradual, but steady improvement is more feasible.

Table 3: The South-East Statistical Region in key figures.[7]

Number of municipalities	10
Number of settlements	187
Area in sq km	2,741
Total population	171,416
Total number of households	49,705
Population density	63 inhabitants per sq km
Urban population	82,772 (48%)
Rural population	88,694 (52%)

[7] All statistical information is taken from the following study: Pre-feasibility Assessment of Options for Establishment of an Integrated Solid Waste Management System in the South-East Region, Macedonia, prepared by REC Country Office Macedonia and ProConsult, Skopje (October, 2008).

It will be already a big improvement, if there is firstly a well-managed landfill which meets EU environmental standards and if all the waste in the region is systematically directed there while existing minor dump-sites, as well as all illegal dump-sites can be closed and will not be used anymore. The task of the project was therefore to help finding an appropriate solution for the landfill with least impact to the environment but to ensure at the same time that all actors, which are involved in the establishment of the waste management system, now take into account future developments and think about higher recycling and recovery targets, that will also be of concern for them, since European legislation requires them.

Fig. 5: Dump-site in rural area in Macedonia. With the development of the new landfill, such small sites in the open land shall disappear | Photo: M. Lindert

4 Activity report

4.1 Overview

During the project six main activities were carried out: a kick-off meeting, organised in connection with the fact-finding mission, which was preceded by a longer planning phase. Due to the official granting of the project as of 1 December, 2009 and the following Christmas holiday periods, this could only be organised in February 2010. Then a workshop for local authorities and participants from the Macedonian Ministry of Environment and Physical Planning was held in May, after the publication of the tender in April 2010. A second workshop could be organised which was then only lead by the Macedonian experts without foreign support and which allowed to discuss further issues related to the tender process and to deliver the topics provided by foreign experts during the first workshop to more municipal representatives. In the meantime, the German and Latvian experts prepared a set of organisational and management recommendations for regional waste management with feedback from the Macedonian side.

Table 4: Schedule of activities

		2009	2010							
	Activity / Month	12	1	2	3	4	5	6	7	8	9
1	Planning and Kick-off Meeting (15 February)										
2	Fact finding mission to Macedonia (16-18 February)										
3	Workshop preparation										
4	Workshop in Strumica (13-14 May)										
5	Development of Recommendations										
6	Workshop in Ohrid (21-22 September)										

The following subchapters summarise the course of action and proceedings of each main activity.

4.2 Kick-off meeting and fact finding mission

The kick-off meeting of the project was held back to back with the fact-finding mission in Macedonia. Prior to the meeting the general frame and information about the present activities going on in the area of waste management in Macedonia could be exchanged to bridge the time until the actual meeting of the project partners in Skopje on 15 February, 2010. There, more detailed information of the latest events could be exchanged. The kick-off meeting took place in the Macedonian capital Skopje from where the participants moved South-East to the city of Strumica.

The participants of the mission were Mr. Philipp Engewald (Project Manager/Baltic Environmental Forum (BEF) Germany), Ms. Kristīna Veidemane (senior environmental expert/BEF Latvia), and the external Latvian experts, Mr. Armands Nikolajevs (Director/Latvian Association of

Waste Management Companies, LASUA), and Mr. Aivars Sirmais, (North Vidzeme Regional Waste Management Organization, ZAAO).

Table 5: Sequence of activities during the first visit to Macedonia (15-18 February 2010)

Date	Location	Activity
15 February	Skopje	Meeting between BEF Germany/BEF Latvia, and Latvian experts and the local partner Regional Environmental Center, Country Office (REC CO) Macedonia
16 February	Skopje	Meeting with Ms. Kaja Šukova, Ministry of Environment and Physical Planning, Head of Department for Sustainable Development and Investments
17 February	Strumica	Participation in a meeting of the newly established Committee which manages the tendering procedure for the establishment of the regional landfill / Presentation and question and answer session
18 February	Skopje	Follow-up meeting between BEF Germany/BEF Latvia, and Latvian experts and the local partner REC CO

On 11 February, 2010, a few days before the mission, the procedural principles for the tender were approved by the Macedonian parliament. The Commission negotiating the tender was established on 17 February in Strumica, and the project team participated in the first session, where the principles for the tender were explained.

- The procedure will be a competitive dialogue with a foreign investor. There is no local company that could perform the necessary tasks.
- Once tender documents are approved by the Commission the tender will be translated and published. Further procedure: 37 days for bidders to provide initial offers, then pre-selection of suitable offers in English and Macedonian. The procedure as such foresaw two steps. In the first step, the interested potential operators would provide detailed information about their technical, operational, and managerial capacities to identify the most experienced candidates. Those pre-selected would be invited to submit an offer where the technical details for the particular region are to be specified.
- Contract will be obligatory regarding the construction of a landfill (full investment of the private operator), optionally, the bidder may include in the offer separate or comprehensive solutions for the following two additional issues: the collection of waste in the region and the closure of illegal dump-sites.
- It was expected, that it would be more attractive and beneficial for bidders to provide a comprehensive offer on all three items. No information about what will happen, if no bidder includes one or both optional items in their offers, was given.
- Potentially, there would be financial support from the government, if unavoidable. But this would not be communicated openly in the tender.
- The concession for operation of the landfill shall be issued for a period of 25 years.

The Macedonian Ministry of Environment expressed concern that bidders will negotiate with the Committee only about the establishment of the landfill, but not about the transportation. It is feared, that this will happen bilaterally with each municipality individually, and municipalities are played off against each other, endangering the negotiations on the landfill. Therefore, the ministry favors that the whole region jointly negotiates with the bidders on all issues.

By now, the major concerns of the municipalities, once the new operator is in place, were the following: Firstly, what will happen to existing municipal enterprises with its staff and existing equipment? Will workers be taken over by a new private operator?

Secondly, it was not clear, what will happen to tariffs and fees? How will they be set and how will they be paid and how will the revenues be distributed between the operator and the municipalities.

Until shortly before the visit of the Latvian and German delegation it was expected, that finding a basis for cooperation among the municipalities would be the most crucial point to tackle. However, during the mission it became clear, that a memorandum of understanding between the 10 municipalities of concern had been signed. This shifted the needs for support from Germany and Latvia to be delivered with the help of this project and the experts sought to identify the needs, which were to be addressed in a workshop in the next stage of the project:

- Technical assistance related to documentation;
- What to find out in the dialogue, what to pay attention to, to avoid being ripped off by a bidder, where are the hidden issues; what are the spaces that should be left for the bidder to make it attractive to invest – finding the right balance;
- Technical aspects (technology);
- Model of institutional setup;
- Closure of illegal dump-sites is considered a very important issue;
- Important are all aspects on finances, costs, and potential revenues,

Fig. 6: Meeting with representatives of municipalities of the South-East Region and the Ministry of Environment and Physical Planning in Strumica, 17 February, 2010 — senior expert on waste issues, Kristina Veidemane (BEF Latvia) during a question and answer session (left at speaker's desk).| Photo: P. Engewald

During the meeting with the regional Committee in Strumica, the Latvian experts presented an example for the establishment of a modern waste management system in the North Vidzeme Region in Latvia. The geographical range and the amounts of waste handled there are quite comparable to the Macedonian case. Although, the example is not a form of public-private partnership, many technical and operational details were relevant (e.g. tariff and fee system, potential sources for additional benefits from energy generation and waste sorting. It gave the participants a practical example of how the future landfill in the South-East Region could look like.

In conclusion, the approach to first have a fact finding mission was a successful tool to get a clearer understanding of the situation in detail and particularly to understand what expertise in particular is needed to help establishing a regional waste management system in Macedonia.

4.3 First Workshop

Following the information gathered during the fact finding mission, a workshop was organised which took place on 13-14 May, 2010. The workshop, "Establishing Regional Waste Management system in Polog Region and South-East Region in Republic of Macedonia", took place in the town of Strumica (cf. Fig. 3). Around 30 participants (excluding the project team) from local authorities of the South-East Region and the Polog Region in North Western Macedonia, as well as the Macedonian Ministry of Environment took part in the event. Originally, the event was only planned to be held for the South-East Region, but as developments in the second region which is establishing a regional landfill, the Polog Region, around the city of Tetovo, had accelerated, it was possible to include participants from that region.

The foreign experts which participated as speakers and resource persons in the workshop were Ms. Kristina Veidemane and Ms. Ingrida Bremere from BEF Latvia, Mr. Mark Lindert (City of Düsseldorf) Mr. Aivars Sirmais (ZAAO), Mr. Armands Nikolajevs (LASUA), and Mr. Janis Abeltins (Geokosultants)

Fig. 7: Workshop in Strumica, 13-14 May, 2010. | Photo: M. Ordzanova

The following topics were discussed at the workshop in separate sessions:

- Experience with public-private partnership options for waste management (Examples from Germany and Latvia);
- Landfilling of municipal waste, including EU targets on the landfilling (incl. biodegradable waste), national legal preconditions for effective landfilling with least environmental impact, costs for constructing and maintaining landfills, role of the national landfilling tax;
- Alternative technologies for disposal: mechanical-biological treatment and pre-treatment of waste at the landfill;
- Waste collection and transportation, including the topics recycling and recovery targets for packaging waste, different actors and the requirements for a collection system: development of different services, frequency of services and fee, and costs for waste collection, costs positions for fee;
- Closure of old dump-sites: Technical steps to be taken; costs for closure (per ha, per capita, per technologies);

- Contracting with end-users of waste management services: local regulations of municipalities and enforcement of signed contracts; the form of the contracts with legal entities, individual households; contracting and payments;
- Wrap up on potential concession and institutional setup: benefit and risk evaluation for each concession model; recommendations for competitive dialogue.

Subsequently, the proceedings and discussion topics are described in more detail.

Fig. 8: Workshop in Strumica – presentation by Mr. Aivars Sirmais | Photo: M. Ordzanova

3.3.1 Experiences with public-private partnership with presentations by Armands Nikolajevs and Mark Lindert

In this session different models of partnership between the public and the private sector were discussed. Different alternatives for arranging the public-private partnership between the local authorities (the municipalities) and the potential private partners were presented:

Establishing partner relations with the private sector are possible:

(1) In the area of collection and transportation of the municipal waste at regional level (the private partner may provide and finance the supply of the necessary equipment, organize and execute the delivery of the service)
(2) In financing, designing, constructing and operating the regional landfill
(3) In financing, designing and closing the existing unregulated landfills.

The advantages and disadvantages with regard to above mentioned possibilities were discussed. The main emphasis was given to the following issues:

- The reorganization of the public utilities will reduce the number of employees (through the preparation of a special agreement, the private partner may be obliged to keep all employees in the new company).
- It is not recommendable to award the concession to less than 5 years (there are some cases where the concession was awarded on three years, but it seems to be very stressful for

the concessionaire and for the conceding authority as well who should announce the tender procedure over and over again).

- It is acceptable for the municipality to charge the costumers with a fee for waste collection and transportation and then pay the company which provides the service for the customers (to be stipulated within the contract) – Corporation Agreement.
- The producers and traders of products that leave behind packaging waste are obliged to organize a system for the selection and separate collection of different types of packaging waste within the municipalities. Of course, this activity should be organized in cooperation with the respective local self-government unit, however it is first of all the producer's responsibility to ensure a proper collection.
- The advantage for the new private partner would be reaching the national targets for the reduction of waste commodities.

The discussion moved to the descriptive part of the tender documentation:

- Establishing a regional concept for municipal solid waste management practically means delivering the total waste generated in the municipality to the relevant pre-treatment and disposal facilities. Having in mind that the local authorities should prevent the illegal waste dumping at any cost, before the regional landfill is set in place, one existing landfill with low level of risk for the environment needs to be used temporarily.
- The proper methodology for the calculation of a landfill fee should be determined.
- Because the announced tender is tackling the household and non-hazardous communal waste generated in the municipality, it was requested the construction and demolition waste to be treated on the new landfill as well. This issue is to be taken into consideration especially for the Polog Region where many wild dump-sites are scattered around.
- Regarding construction and demolition waste to be pre-treated by the potential private operator (considering the possibility to handle this waste on the location where the regional landfill will be constructed or to be crushed and used as covered material) it was proposed to use a special mobile equipment for waste crushing.

3.3.2 Alternative landfilling technologies with presentations by Mark Lindert, Aivars Sirmais and Kristina Veidemane

Different aspects of landfilling technologies need to be taken into consideration when the final solution for the regional integrated waste management has to be chosen. With that regard, the following issues were stressed out:

- Besides the fact that the concession for the regional landfill is given for at least 25 years due to the big investment needs, it is proposed that the construction of the landfill is carried out cell by cell, because this gives the opportunity for splitting the investment (per cells). The initial investment for the construction of the first cell is the crucial and the most expensive one, but the investment into future cells will rely on the profit from charging the costumers a fee for waste management services. The future investment needs for new cell construction will mainly depend on the introduction of new technologies for pre-treatment of waste (the more waste commodities are pre-treated the less space for landfill is needed).
- It is proposed to keep a record about the composition of waste intended for disposing as the chemical composition of waste determines the need for providing a suitable landfill construction and technology (e.g. lining system, lagoons for treating the leachate etc.). What kind of technology for landfill construction will be introduced mainly depends on the types of waste commodities disposed of.
- The international experts evaluated the competitive dialogue process for the selection of potential bidders (private operators of waste management facilities) as a very complex and demanding process, but at the same time as the quickest one. The Latvians financed the

construction of their regional landfills through funds from the Instrument for Preaccession Assisstance (IPA) (65 – 80% EU contribution; up to 15% - Latvian State co-financing, remaining share municipal means). Preparing an IPA application is time-consuming and requires respective feasibility studies, as well as detailed documentation to be prepared before the application can be submitted (at least three years for preparation of relevant technical documentation are needed as well as special budget allocation to be designed for this specific activity).

- The existence of a market for waste management services may reduce the prices (for waste management) and make negotiations over prices possible.
- It is recommendable for the larger investments that the contract with the private operator covers at least 20 years.
- Because this 20 years period is a pretty long period during which for example the prices for electricity may change, it is recommendable to make revisions of the prices for the services that are determined within the contract (from year to year) possible.
- There is a need for clarification within the descriptive tender documentation regarding the type of waste commodities that are subject of the contract for the collection and transportation of waste (e.g. the mixed households' waste only; can the organic waste be covered by the service? etc.) – The fee amount for the collection and transportation services depends on the waste commodities' type for which the system for collection and transportation is provided.
- If for each specific waste commodity a special system for selection and separate collection is set in place an adequate price for the respective services needs to be established.

The second day of the workshop continued with the topic of closing old municipal non-sanitary landfills.

3.3.3 **Closure of old municipal non-sanitary landfills and the wild dump-sites scattered around the municipality with presentations by Jānis Ābeltiņš and Armands Nikolajevs**

The following discussion arose:

- The scope of the descriptive tender documentation needs to be precisely defined. It is up to the municipalities to decide will they remediate the wild dump-sites by allocating a special budget line of their local budgets or will they be more interested to leave this responsibility to the future private operator – the concessionaire of the waste management services.
- According to the Law on Waste Management local self-government units are responsible for the remediation of the non-sanitary landfills. If they lack financial resources to carry out the closure of the non-sanitary landfills and their aftercare, they have to make a contract with the private operator who will be responsible for the remediation of wild dump-sites and this will probably aggravate the fee amount for waste management services charged from the inhabitants.
- The potential private operator is obliged to make a review and to propose possible solutions at minimum technical requirements (by complying with both, the EU and national standards at minimum price) in order to justify the remediation of the existing non-sanitary landfills. Depending on the type of waste disposed onto the landfill the technical solutions are to be proposed respectively (e.g. technology for extraction of landfill gas – CH4 to be introduced on those landfill sites with high altitude at cross section where a huge amount of organic waste is disposed of).
- If they do not comply with the agreed timeframe for the closure of the non-compliant landfills, the EU countries are getting penalized by the European Commission.

3.3.4 Contracting with end-users with contributions by Ana Petrovska, Ingrida Bremere, Aivars Sirmais and Mark Lindert

Contracting the end-users of waste management services is a very complex issue and it may require many different preparation activities before the final contract is concluded. The issues discussed with this regard were the following:

- According to the Law on waste management the municipalities are the responsible authorities obliged to handle the non-hazardous waste generated within their municipalities. This practically means that they should find the most appropriate methods for managing the residual waste in an environmentally friendly manner.
- If they not possess enough capacities (weak public enterprises – non-efficient and over-employed) they should announce a tender and look for a concessionaire (private operator who will provide services for the collection and transportation of waste). The municipality should make an agreement – contract with the private operator in which all previously negotiated details will be stipulated (e.g. fees for waste services – a charging method to be specified – monthly fixed tariffs per household or charging the households per volume (or tone) of waste generated per month. This will consequently foster waste reduction activities).
- Introduction of incentives – a system for returned receipt of the used products and packaging and/or by selection and separate collection of certain waste commodities delivered to special waste treatment facilities should be introduced.
- The private operator who delivers the service of collecting and transportating waste should make a contract with the respective landfill operator about the acceptance of waste intended to be disposed of.
- Depending on the agreed technology to be established at the landfill facility (recycling and/or waste recovery facility), negotiating performances are needed for the determination of the fee for waste services.

3.3.5 Review of the tender documentation

At the final session Ana Petrovska (REC Macedonia) introduced the descriptive tender documentation. The perspectives and what should potentially be taken into consideration during the negotiation with the potential private operators were discussed:

- The potential private operator is looking for a clear situation in the negotiation with the conceding authorities (the municipalities): Detailed information on income (revenues) and expenditures of the public enterprises as well as on the available technical equipment is needed.
- After selection of the potential bidders on the announced tender, an invitation for participation in the competitive dialogue as well as the descriptive tender documentation is to be delivered to the selected potential private operators.
- The timeframe of activities with justified solutions for waste management under minimum technical requirements is to be proposed by the potential bidders as well as (solutions for managing of the construction and demolition waste for Polog Region and solutions for managing of the organic waste for the South-East Region).
- The conceding authorities need to be ready for negotiation with the potential bidders and to be open for providing them with relevant technical information (e.g. number of customers receiving waste management service, percentage of customers who pay for the service on a regular basis etc.) and statistical data for the region. A list of confidential information prescribed by the potential bidders has to be presented to the municipalities when the negotiation process with the selected candidates is starting.

- Consensus upon the type of agreement (concession or corporation – public-private partnership) that may be concluded with the potential private operators has to be adopted between the municipalities.
- The benefits for the hosting municipality of the landfill facility are to be clearly defined (the authorities representing the hosting municipality are invited to come up with a list of demands and those should be subject to a review in the negotiation with the potential private operators).

In conclusion, the workshop had two benefits: for the participants it was a valuable opportunity to exchange information and experiences with the colleagues from Germany and Latvia to get an impression about PPP relationships and also to get to know different options for establishing the landfill in the context of a regional waste management system. For the German and Latvian experts in return, the discussion with the Macedonian colleagues provided a necessary input for the development of the recommendations.

4.4 Second Workshop

A second workshop was organized by REC Macedonia in the city of Ohrid (21-22 September 2010).

The first day was devoted to specific issues in connection with the tendering process and the inter-municipal agreement that must be signed in order to ensure proper conditions on the territory covered by the regional landfill. Mostly, this concerned participants from the South-East Region, involved in the tender process. Additionally, there were some observers from the Polog Region, which intends to build a similar landfill. The agenda of that day foresaw the following topics:

- Scope of joint operations,
- Content of inter-municipal agreement,
- Legal form of inter-municipal agreement,
- Types of PPP.

On the second day, a wider audience of participants — staff from the municipalities in the South-East and Polog Regions, which could not attend the first workshop — were provided with information from the previous workshop regarding:

- Waste Framework Directive,
- EU targets on the landfilling (incl. biodegradable waste),
- Law on waste - national requirements,
- Alternative technologies for disposal,
- Mechanical-biological treatment,
- Pre-treatment of waste at the landfill
- Other modern technologies (incineration, etc.),
- Conclusions and closure of the event.

The second day did not reveal any new questions as the organizers and presenters tried to address the most crucial discussion points which were discussed already in the first workshop. In the following the most important issues of the sessions of the first day are presented:

4.4.1 Scope of joint municipal-private operations

1. **Waste collection** will be carried out by the existing public enterprises; provided an equal or lower tariff offered per collected ton / cubic meter of waste also by a potential private partner, willing to cover the waste collection service for the entire municipality; in addition, the partnership with a private service provider is conditioned with the transfer of qualified staff

employed in the public enterprises into the new venture. Not all municipalities which lack a public enterprise are willing to enter into a partnership with a private operator, although they are all aware that the waste generated on their territory will somehow have to be delivered at the gate of the regional waste treatment / disposal system.

2. **Long hauling** appeared to be even more sensitive than the waste collection, because: (i) municipalities which intend to provide the waste collection and transport on their own right lack appropriate long hauling capacity; (ii) the municipalities located closer to the regional landfill(s) do not appreciate the sharing of transport costs over the region. Especially the municipalities hosting the regional landfill(s) do not want to share the transport expenses of other municipalities, believing that their gate fee should be lower as to compensate them for accepting the waste generated across the region. The above issues, especially the compensation of municipalities hosting the regional landfill(s) should be carefully addressed in the inter-municipal agreement, but also some conceptual solutions should be sought, in order to minimize the long hauling distances and to equalize municipal burdens.
3. **Closure and remediation of non-compliant landfills**. Municipalities do not want to share the costs of closure / remediation, especially if there are only small dump-sites on their territory that can be cleaned up using their own resources. Some municipalities have stated that they inherited some dump-sites from the former, now obsolete territorial division and therefore they could consider them as “historical pollution” which would mean transferring the responsibility for their closure to the national level. The inter-municipal agreement should define the most appropriate cost sharing method among the municipalities.

4.4.2 Content of an inter-municipal agreement

1. The need to define the share of each municipality in the venture, including the limits of risk sharing, was understood and appreciated by municipalities; however, there was no decision on how to define it. The most common criterion for defining the shares is the number of inhabitants and/or the generated waste quantities. Rural municipalities also asked for a special status due to worse socio-economic situations. Two major types of risks linked to regional operations were identified: (i) financial and (ii) environmental risk. The financial risk may derive from the failure of some municipalities to pay their gate fees and/or to deliver contractually specified waste quantities. Therefore, apart from the risk sharing stipulations for the joint operations, there should be determinants for individual disobedience in the inter-municipal agreement. In case of non-payment by a single municipality, there could be an instrument available to withdraw funds granted from the national budget. An example can be seen in the case when an annual VAT transfer from the Ministry of Finance intended for the non-paying municipality is diverted to the regional private operator. Another option is to withdraw funds for the implementation of regional development projects. The environmental risk, however, lies fully with the municipality hosting the landfill; therefore it should be compensated by other municipalities in an appropriate manner. The inter-municipal agreement should propose some compensation methods which municipalities will discuss and decide upon.
2. The municipalities agreed without hesitation upon delivering the waste generated on their territory exclusively to the regional facilities, rather than at unauthorized dump-sites. Most municipalities which intend to provide waste collection services declared that they are, or will be able to collect the waste from their entire territory; also, they stated that the municipal communal inspectors will ensure that waste is not dumped illegally but is rather delivered at the gate/reception point. These commitments must be reflected in the inter-municipal agreement. It must be stressed that municipalities that will contract out the waste collection will deal with these issues by way of individual contracts.
3. Increase of (the domestic) disposal tariffs must be approved, according to law, individually by each of the 10 municipal councils involved in the South-East Region. This may prove to be a very challenging issue, which may cause difficulties for the private operator who runs the regional integrated waste management system and collects fees from end-users. The same applies to the concessionaires who would provide waste collection and transportation and collect fees from end-users. The inter-municipal agreement must introduce an appropriate mechanism for diminishing the private operator’s losses deriving from failures of municipalities to adopt increased tariffs.

4. Reserves and precaution arrangements have not been entirely understood. Some additional information may be important to discuss further the methods for generating such reserves: whether insurances and/or guarantees can be used for such purposes or the municipalities must have available reserve funding in any case and where such funds may be obtained from. This issue must be further addressed during coming meetings and discussions.

4.4.3 Legal form of inter-municipal agreement

Once the inter-municipal agreement is drafted and agreed upon by participating municipalities, there should be one party assigned to be legally responsible towards the private partner for any issues including the court cases against one or more municipalities not complying with either the inter-municipal agreement or the concession contract. Municipalities were given three alternative legal forms of a legal representative of the multiparty conceding authority:

1. Simple contract with one municipality appointed as representative; this alternative was considered the least applicable, because municipalities were hesitant to appoint one municipality to bear all the risks on behalf of others;
2. An inter-municipal public enterprise alternative was compromised, because such entity is usually established to provide a communal service, while in this case, its role would be reduced on administrative and financial issues only;
3. Establishment of an Limited enterprise (Ltd); this was not sufficiently analyzed, however, any legal person, including an association of municipalities, could be established in order to guarantee that the contractual conditions are met by all the municipalities, on one hand, and by the private partner, on the other.

Some municipalities argued that during the workshop the focus of discussions was on the municipal commitments while the requirements to be met by the private partner were neglected. Also, the Councils of planning regions were suggested as a platform to ensure the execution of the inter-municipal agreement. It must be stressed that the Councils are a political decision-making instrument for regional development policies, while the Centres of planning regions, which execute the councils' decisions, are legal persons with a mandate to provide administrative support and to manage regional funds channeled through the Agency for Regional Development that implements annual programmes on the national level. It is to explore further whether any existing form of inter-municipal cooperation can be utilized to act as an umbrella for the execution of the inter-municipal agreement.

Additional information is needed to further specify the potential coordination, administrative and financial role of the third party representing the municipalities in front of the private partner.

4.4.4 Types of PPP

Contractual and institutional concessions were compared on the grounds of the risk sharing between the private and public partner as well as the probability for early contract termination. The municipalities were not interested in exploring an institutional concession due to the minority shares in the joint venture and the permanent loss of contributed assets. Monitoring over the implementation of contractual obligations by the private partner was seen as part of the enforcement activities of authorized national / local environmental inspectors (for the environmental part of the contract) as well as of the financial auditing for the financial performance of the future operator. However, the monitoring remains a critical issue and the controlling of the private operator's performance must be organized exclusively for this contract, notwithstanding the environmental and corporate law enforcement to be carried out through appropriate institutions.

Municipalities might need additional information on the risks for early termination of the concession contract and the exit strategies to deal with potential discontinuation of services deriving from the institutional and contractual concession. Monitoring issues should be further discussed and a monitoring framework should be agreed upon after the first stage of the dialogue phase

4.5 Recommendations to develop a regional waste management system

4.5.1 Development

On the basis of the information gathered during the two visits of the German and Latvian experts to Macedonia, and taking into consideration the discussions during the project implementation, a set of recommendations was developed, that will help the South-East Region in its efforts to establish a regional waste management system and also with the coming steps of the running tender procedure. The recommendations are part of the annex of this report.

The document takes into account the given situation in the South-East Region and the one of waste collection and landfilling in Macedonia in general, where there is much emphasis on the establishment of a suitable environmentally sound landfill. Nevertheless, the recommendations have a wider goal: looking ahead and pointing to the fact that landfilling is not the best solution for waste handling, but avoidance of waste and recycling are preferred. Still, the document provides information about how to organize and properly manage a landfill. It takes into account that the financial resources in Macedonia are rather limited and that there is still capacity building needed that focuses on waste management systems and technologies, commonly used in Western Europe.

The recommendations were prepared by Ms. Kristina Veidemane, Ms. Ingrida Bremere (both BEF Latvia) and Mr. Mark Lindert from the City of Düsseldorf.

4.5.2 Contents

The recommendations are kept short, but try to touch a comprehensive set of topics:

- Relevant waste policy issues in the EU and the Republic of Macedonia
- Municipal waste generation and collection in the Republic of Macedonia
- Development of a regional waste management system
- Waste landfilling and pre-treatment
- Waste collection system
- Biodegradable waste
- Waste recycling
- Closure and remediation of the former dump-sites and landfills
- Organisational and contractual aspects
- Economic aspects

The initial chapter recalls the most important requirements which are defined by national Macedonian and EU legislation now and in the future, the second chapter briefly sketches the current situation in Macedonia with regard to the waste generated and its collection and puts the given situation into a Europe-wide context. It shows that the current amount of waste produced in the South-East Region (approx. 250 kg per capita annually) is comparable to the situation in Latvia of the early 1990s shortly after the breakup of the Soviet Union. The trend there, however, is a fast growing amount of waste which is gradually coming closer to the EU average of around 520 kg per capita. The increase is partly due to better monitoring and more reliable data than in the beginning of the 1990s, but mostly due to a better economic situation where people substantially buy more goods and generate more waste. A similar process can be expected in Macedonia, the speed however is depending on the future economic development.

In the following chapters, the recommendations try to briefly outline different options and to highlight their effectiveness in dependence to the actual circumstances. Costs are considered where appropriate. Eventually the recommendations draw the following conclusions:

The very first step is to stop “wild dumping” and to establish proper landfills to avoid environmental pollution. The investments must be combined with an efficient law-enforcement “on site” and effective public relations activities to make clear that Macedonia does not intend to become a “littered” country.

The Ministry of Environment and Physical Planning and the municipalities in the South-East Region have launched a tender on the construction and operation of a landfill by private companies, which are potentially foreign companies, as there is no local company that would be capable of taking over these tasks. This is in so far understandable as landfills are complex establishments, their set-up und operation needs a specific knowledge and they require high initial investments. A strategic problem might be that Macedonia gets into a position of dependency from international waste management companies, if the majority of landfills are built and operated by foreign private companies.

The currently on-going tendering process is complex and new for municipalities. They are hesitant to continue with the process and they may feel overrun by the whole process. Municipalities have to make it clear to themselves that economic prosperity and “wild dumping” of waste do not go together. It will be easier to understand if local businesses and/or municipal companies participate in the evolution of the system. They must be the local “crystallisation points” for a growing industry of resource-recovery, including respective job opportunities.

Currently, the local waste management companies operate with a relatively small volume of waste turnover. They need to grow to cover new tasks like (separate) collecting and recycling. This means to select the ‘easier’ manageable pieces first – but start!

It is assumed that, during the following years, the smaller companies will merge, for example on a rural or regional scale. Cooperation between municipalities – at least between the smaller ones – will be a “must”. The alternative would be to be ‘taken over’ by some international waste management company some day. The local waste management companies need to widen their field of operation step by step – and thus might become some important local or rural counterweight to the international companies which potentially operate the landfills.

Government and municipalities need to act as partners in this process. It is important to understand that waste management and “keeping the landscape clean” needs a commitment on the local level, in the local population. Therefore, the municipalities must be given a context to fulfil their tasks, including legal framework and funding.

4.5.3 Influence on the further process

Given, that this project will end with the development of the recommendations, it is difficult to predict, how much influence the document will have on the actual decisions taken in the running tendering process. There are, however, two aspects, which give reason to expect that the document will have relevance: firstly, the document has been carefully prepared, considering the local situation in Macedonia and it is not just a purely generic compilation of recommendations. Secondly, the local project partner REC Macedonia will remain actively involved in the process of the development of the regional landfill and the establishment of the waste management system and will ensure that important aspects will not be ‘forgotten’ in the coming steps.

5 Project management

5.1 Implementing organisations and project team

The project was implemented by three organisations: the Baltic Environmental Forum Germany, the Baltic Environmental Forum Latvia, and the Macedonian Country Office of the Regional Environmental Center for Central and Eastern Europe. BEF Germany and REC have been co-operating since 2005 in three other projects. BEF Germany and BEF Latvia are both members of the BEF Group, a network of five independent environmental non-governmental non-profit organizations in the Eastern Baltic Sea Region.

The REC is an international organisation with a mission to assist in solving environmental problems. The Center fulfils this mission by promoting cooperation among governments, non-governmental organisations, businesses and other environmental stakeholders and by supporting the free exchange of information and public participation in environmental decision making. The network has offices in 13 countries and the Kosovo.

Table 6: Implementing organisations and their role in the project

Organisation	Role in the project
BEF Germany Baltic Environmental Forum Deutschland e. V. Osterstraße 58 D-20259 Hamburg, Germany	Overall project management and recruiting experts from Germany for experience exchange with Macedonian professionals from local authorities.
BEF Latvia Biedrība „Baltijas Vides Forums” Doma laukums 1 LV-1050 Riga, Latvia	Conceptual leadership and providing expertise on EU waste legislation, appearing as speakers in the workshop and leading authorship of the recommendations, as well as recruiting other Latvian experts for experience exchange with Macedonian professionals from local authorities.
Regional Environmental Center for Central and Eastern Europe Country Office Macedonia ul. Ilindenska 118 MK-1000 Skopje, Macedonia	Local expertise in the area of waste management, organization of events in Macedonia, recruiting local speakers and participants for the events, and maintaining ties to the Ministry of Environment and Physical Planning of the Republic of Macedonia.

In detail, the following members of staff were involved by the three project partner organisations for the implementation of the project:

Table 7: List of members of staff by organization, working in the project

Organisation	Name	Position
BEF Germany	Philipp Engewald	Project Manager
	Heidrun Fammler	Project supervision
BEF Latvia	Kristīna Veidemane	Senior expert
	Ingrīda Brēmere	Senior expert
REC Country office Macedonia	Kornelija Radovanović	Senior Expert and local coordination
	Katarina Stojkovska	Senior expert
	Ana Petrovska	Senior expert
	Milena Manova	Assistant
	Marina Ordžanova	Assistant

5.2 Involvement of external experts

To widen the capacities and experiences the project team was supported by German and Latvian professionals working on a daily basis in the field of waste management. Support came from the German Association of Cities and Towns (DST) and from the Latvian Association of Waste Management Companies (LASUA).

Table 8: List of external experts from Germany and Latvia participating in the project. The second workshop is not listed as no external expert participated.

Name	Organization	Country	Position	Fact finding mission	Workshop	Recommendations
Mark Lindert	City of Düsseldorf Environmental Office	Germany	Head of Waste Management Section	—	S	A
Jānis Ābeltiņš	SIA Geokosultants	Latvia	Director	—	S	—
Armands Nikolajevs	Latvian Association of Waste Management Companies (LASUA)	Latvia	Director	E	S	C
Aivars Sirmais	North Vidzeme Regional Waste Management Organization (ZAAO)	Latvia	Director	S	S	—

Abbreviations: A = author; C = Commenting E = expert, participating in meetings and discussions, but not speaker, S = speaker

5.3 Project implementation

The project implementation was generally smooth and no significant problems were observed. As the project eventually began officially on 1 December, 2009 a kick-off meeting could not be organized anymore in that year. So effectively, the kick-off and the first field mission took place in February 2010. Instead the partners took the opportunity to exchange more detailed information about the latest developments, so that the partners from Germany and Latvia had some background information when coming to Macedonia to make discussions in Macedonia more efficient and specific.

As a result of the findings, the project's focus was narrowed, taking the fact of the on-going tender process into account. The project team adjusted to that and foresaw to prepare the workshop and the recommendations to some extent along the documentation required for the tender. As the actual tender was published only in April, it was decided to extend the project duration by three months until 31 August 2010.

It was eventually decided in August to carry out another workshop for more municipal representatives. For that purpose, the project was once more extended by one month, until 30 September, 2010. The workshop was intended to continue the discussion of the tender and to provide more municipal representatives from the South-East and Polog Regions with information from the first workshop.

As mentioned earlier in this report, the rapid development of the situation in Macedonia required a shift of the project objective. While the initial idea was to give advice on the establishment of a regional waste management system in general, the project had to give advice on how to organize a public-private partnership for a landfill including the tendering.

These decisions were primarily taken by the Macdeonian Ministry of Environment and Physical Planning, without prior announcement and came as a surprise to all involved parties of this project. The German and Latvian members of the project team were informed about the situation only shortly before the field mission.

The project team has highlighted during the field mission and the workshop, as well as in communication with the local project partner REC Macedonia, that the landfill is only a first, but unavoidable step when developing a modern waste management system in the country. REC Macedonia has also clearly pointed out, that the decision was irreversible and all steps towards preparing the tender were already initiated.

Even more a cause of concern, however, is the decision to establish this landfill in form of a public-private partnership. It leads to dependencies of the municipalities, particularly in the case that the private operator of the landfill goes bankrupt. Moreover, it is necessary that the state or local level de facto have sufficient means to effectively control and enforce legislation which ensures that the landfill is operated properly and that no illegal operations are taking place. This also concerns caring for a proper closure of the landfill after its operations cease. As this is in principle a task of local authorities, it is currently foreseen that risk prevention should be taken account of contractually with the private operator for the case that the municipalities do not have sufficient financial means. This is still a critical issue and it should be rather considered that the state foresees to take over the responsibility and to provide finances to the municipalities rather than to leave it to the private operator.

The original objective, that the recommendations prepared should be transferrable to any other region in Macedonia had to be revised. We state here once more that the public-private partnership model for operating a landfill is not promoted. In case that the decision is taken to build a landfill according to a public-private partnership model elsewhere in Macedonia, the document yet does contain valuable information what to take into consideration to establish an EU conform landfill.

6 Conclusions and outlook

Taking into consideration the shift of the focus in the project from generally setting up a regional waste management system to a more concrete case with the actual establishment of a landfill in the South-East Region in Macedonia and a connected collection system, the project has successfully delivered the expected results of this adapted focus.

- In a regional workshop (May 2010) German and Latvian experts have provided information on their countries' experiences in enforcing EU policy and requirements in the field of municipal waste management;
- Having participated in two field missions in Macedonia, German (May 2010) and Latvian (February and May 2010) waste management experts have advised on various options for setting up the regional waste management system's related organisational and technological aspects, particularly taking into consideration the situation with the on-going tender for the establishment of a regional landfill and collection system in the South-East Region;
- Based on experiences in Germany and Latvia technological, organisational and management recommendations for cooperation and legal entity structures for a future regional waste management system were developed for Macedonia. It was taken care that these recommendations are valid and applicable for the whole country and not only for the South-East Region.
- During the meetings and communications closer contacts between Macedonian, German and Latvian waste experts and managers were established for further cooperation — particularly, the local partner considered to invite the German expert, Mr. Mark Lindert, once more in the up-coming second phase of the tendering process.

Looking ahead, from early autumn 2010, the second phase of the tendering process with the development of the technical documentation and the concrete offers from the bidders will be taking place. It is foreseen that a selection of the company that will eventually build the landfill will be made in the end of the year.

On the one hand, it would be helpful to continue to accompany the future procedure in the South-East Region and to provide more specific advice; however, this depends on the needs of the Macedonian side. In principle, the Baltic Environmental Forum is ready to continue. Nevertheless, we must also conclude that with the help of this project, the local partner REC has gained additional input from the experts and is committed to continue to closely follow the process and to make sure that a feasible, environmentally sound solution will be found for the South-East Region.

Annex 1: List of contributions by experts

The following table lists all contributions, i.e. presentations or authorship of the recommendations by German and Latvian experts to the project. The following abbreviations are used to designate an event or output: F = Fact finding mission; W = Workshop; R = Recommendations.

Expert	Title	Type	Event
Abeltins, J.	Closing of the old dump-sites (Experience from Latvian municipalities)	Presentation	W
Abeltins, J.	Costs of constructing and maintenance of the landfills (Experience from Latvian municipalities)	Presentation	W
Bremere, I.	From waste to energy	Presentation	W
Bremere, I.	Organisational and management recommendations for regional waste management in the Republic of Macedonia: targeted at the South-East Region	Author	R
Lindert, M.	Contracting and payment (concerning the end-users)	Presentation	W
Lindert, M.	Costs for waste collection, costs positions for the fee, contracts with the companies	Presentation	W
Lindert, M.	Experience in public-private partnership (example Düsseldorf, Germany)	Presentation	W
Lindert, M.	Mechanical-biological treatment	Presentation	W
Lindert, M.	Organisational and management recommendations for regional waste management in the Republic of Macedonia: targeted at the South-East Region	Author	R
Nikolajevs, A.	Different actors and share of market in waste collection	Presentation	W
Nikolajevs, A.	Experience in public-private partnership (example Jelgava, Latvia)	Presentation	W
Sirmais, A.	Forms of the contracts with legal entities, individual households	Presentation	W
Sirmais, A.	National legal preconditions for successful landfilling	Presentation	W
Sirmais, A.	Pre-treatment of waste at the landfill	Presentation	W
Sirmais, A.	Requirements for an efficient waste collection system	Presentation	W
Sirmais, A.	Waste Management in the North Vidzeme Region in Latvia	Presentation	F
Veidemane, K.	EU targets on landfilling of municipal waste (Considering recycling and recovery)	Presentation	W
Veidemane, K.	Organisational and management recommendations for regional waste management in the Republic of Macedonia: targeted at the South-East Region	Author	R
Veidemane, K.	Role of national landfilling tax	Presentation	W

At the second workshop from 21.-22 September, 2010 in Ohrid, the presentations were held by Macedonian experts in local language:

21 September

1. **Objectives of the workshop,** *Kornelija Radovanovic REC Senior Project Manager*
2. **Scope of joint operation,** *Ana Petrovska, REC Project manager*
3. **Content of inter-municipal agreement**, *Danco Uzunov local waste expert*
4. **Legal form of inter-municipal agreement,** *Danco Uzunov local waste expert*
5. **Types of PPP,** *Ana Petrovska, REC Project manager*
6. **Conclusions,** *Kornelija Radovanovic REC Senior Project Manager*

22. September

1. Waste Framework Directive
EU targets on the landfilling (biodegradable waste)
Law on waste- national requirements, *Lence Kupcieva, MOEPP Legal department*
2. Alternative technologies for disposal
Mechanical-biological treatment
Pre-treatment of waste at the landfill
Other modern technologies (incineration, etc.), *Danco Uzunov local waste expert*
3. Conclusions and closure of the event, *Kornelija Radovanovic REC Senior Project Manager*

Annex 2: Presentations

On the following pages all presentations can be found which were held by the foreign experts at the workshop, "Establishing Regional Waste Management system in Polog Region and South-East Region in Republic of Macedonia", took place in the town of Strumica, 13-14 May, 2010.

They appear here in the order of the workshop agenda.

Day 1: 13th of May, 2010	
9:30	**Welcome and Opening of the workshop:** Representatives of the REC Macedonia
9:40	**Introduction to the potential concession**: contractual versus institutional concession (Representatives of the MoEPP)
10:00	**Experience in public-private partnership in waste management** • Germany : Mark Lindert, Düsseldorf, Germany • Latvia (Jelgava and Daugavpils): Armands Nikolajevs, Association of Waste Management Companies, Latvia **Questions and Discussion**
11:00	Coffee break
11:30	**Landfilling of municipal waste:** • EU targets on the landfilling (biodegradable waste) Ingrida Bremere, Baltic Environmental Forum, Latvia • National legal preconditions for successful land filling; Aivars Sirmais, Regional Waste Management company "ZAAO", Latvia • Costs for constructing the landfills and maintenance of the landfill Jānis Ābeltiņš Association of Waste Management Companies, Latvia • Role of the national tax of landfilling Kristina Veidemane, Baltic Environmental Forum, Latvia **Questions and Discussion**
13:00	Lunch break
14.00	**Alternative technologies for disposal:** • Mechanical-biological treatment Mark Lindert, Düsseldorf, Germany • Pretreatment of waste at the landfill Aivars Sirmais, Regional Waste Management company "ZAAO", Latvia **Questions and Discussion**

14:45	**Waste collection and transportation:** • Recycling and recovery targets for packaging waste; Kristina Veidemane, Baltic Environmental Forum, Latvia • Different actors and and share of market; Armands Nikolajevs, Association of Waste Management Companies, Latvia **Questions and Discussion**
15:30	Coffee break
16:00	• Requirements for collection system: development of different services, frequency of services and fee Aivars Sirmais, Regional Waste Management company "ZAAO", Latvia • Costs for waste collection; costs positions for fee Mark Lindert, Düsseldorf, Germany **Questions and Discussion**
18:00	**Closing of the day**
Day 2:	**14th of May, 2010**
9:00	**Opening**
9:15	**Closure of the old dump-sites:** • Technical steps needed to be taken; • Costs for closure (per ha, per capita, per technologies) Jānis Ābeltiņš, Association of Waste Management Companies, Latvia Armands Nikolajevs, Association of Waste Management Companies, Latvia **Questions and Discussion**
11:00	Coffee Break
11:30	**Contracting with end-users** of waste management service: • Local regulations of municipalities and enforcement of signing contracts Ingrida Bremere, Baltic Environmental Forum, Latvia • The form of the contracts with legal entities, individual households; Aivars Sirmais, Association of Waste Management Companies, Latvia • Contracting and payments Mark Lindert, Düsseldorf, Germany
13.00	Lunch / Departure
14:00	**Wrap up on potential concession and institutional setup:** • Benefit and risk evaluation for each concession model; • Recommendations for competitive dialogue. Kristina Veidemane, Baltic Environmental Forum, Latvia Representatives of the REC Macedonia **Questions and Discussion**
15.30	Coffee break
16.00	Departure

Presentations (First Workshop May 2010)

Mark Lindert: Experience in public-private partnership in waste management

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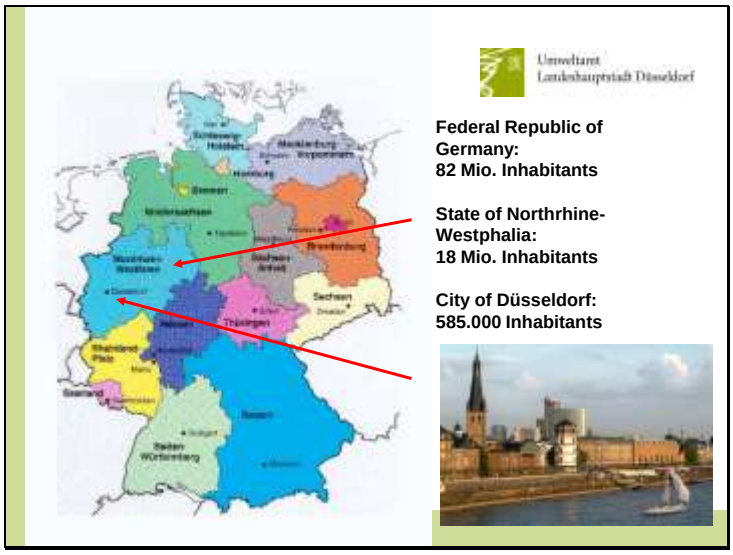

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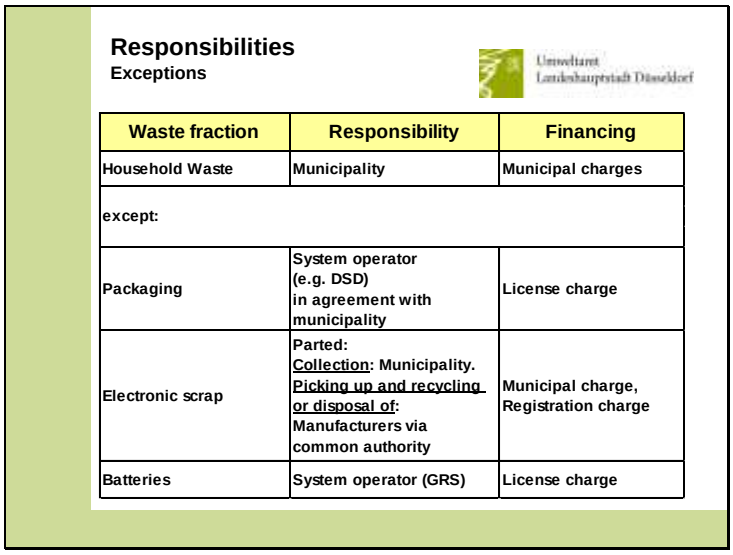

Waste fraction	Responsibility	Financing
Household Waste	Municipality	Municipal charges
except:		
Packaging	System operator (e.g. DSD) in agreement with municipality	License charge
Electronic scrap	Parted: Collection: Municipality. Picking up and recycling or disposal of: Manufacturers via common authority	Municipal charge, Registration charge
Batteries	System operator (GRS)	License charge

Slide 5

Umweltamt
Landeshauptstadt Düsseldorf

Waste Management Planning on State Level:

Waste Management Plan of State of Northrhine-Westphalia
- **Common Waste**
- **Hazardous Waste**

Targets:

- **to make sure that there is enough capacity to treat and dispose of the different types of waste**
- **to make sure that no waste with heating capacity is disposed of in a landfill without pre-treatment**

Slide 6

Umweltamt
Landeshauptstadt Düsseldorf

Düsseldorf district:

Incineration plants and related regions

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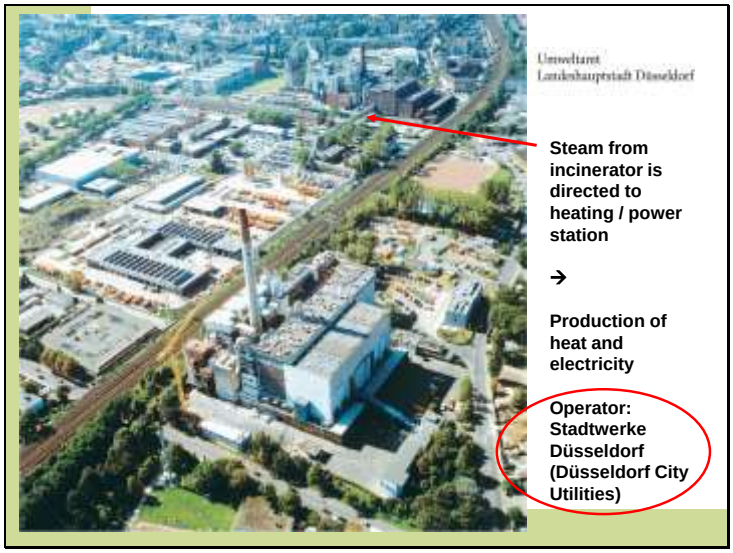

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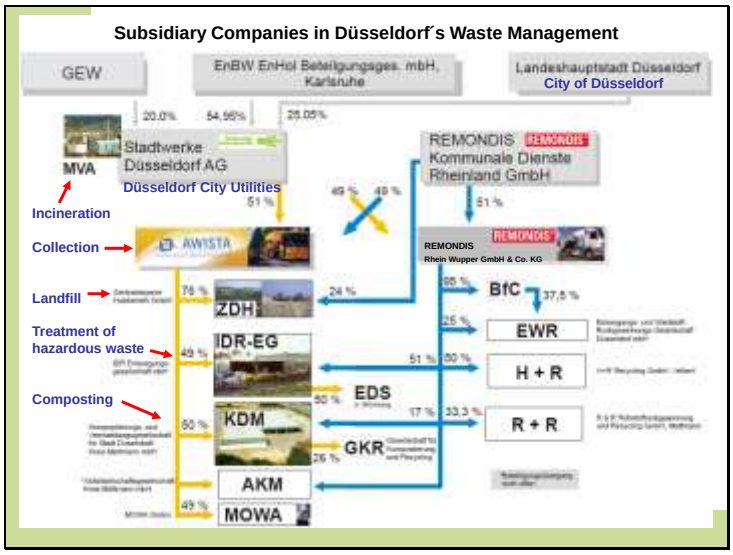

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Armands Nikolajevs: Experience in public-private partnership (example Jelgava, Latvia)

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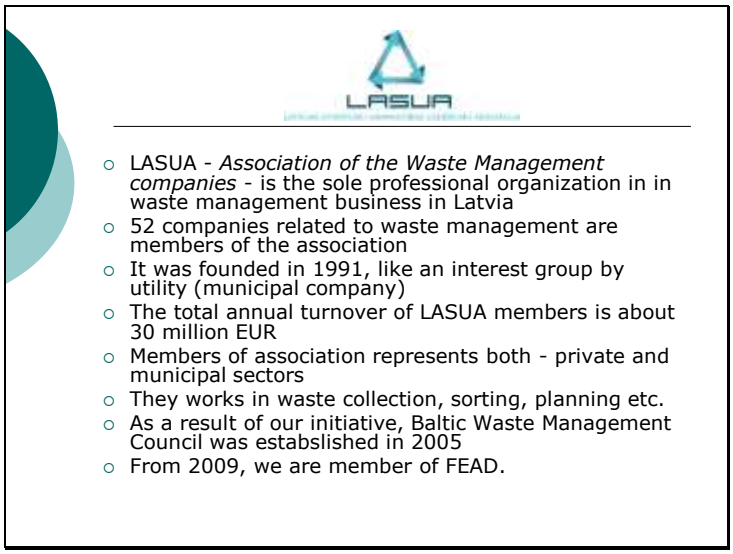

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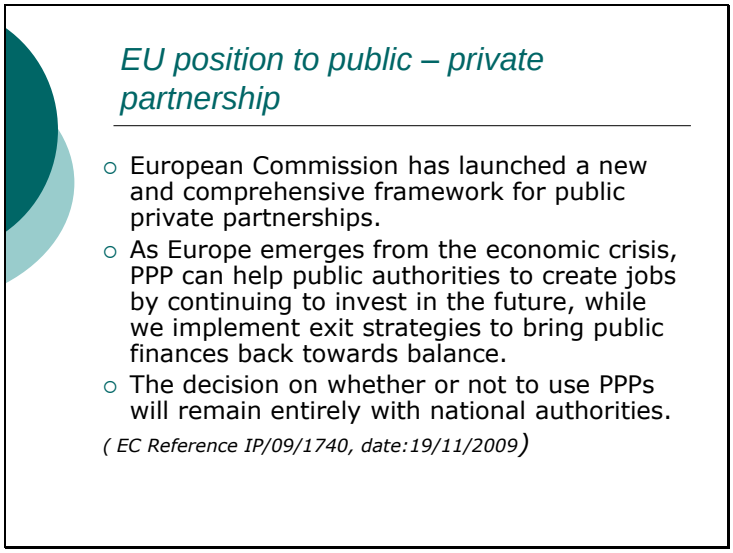

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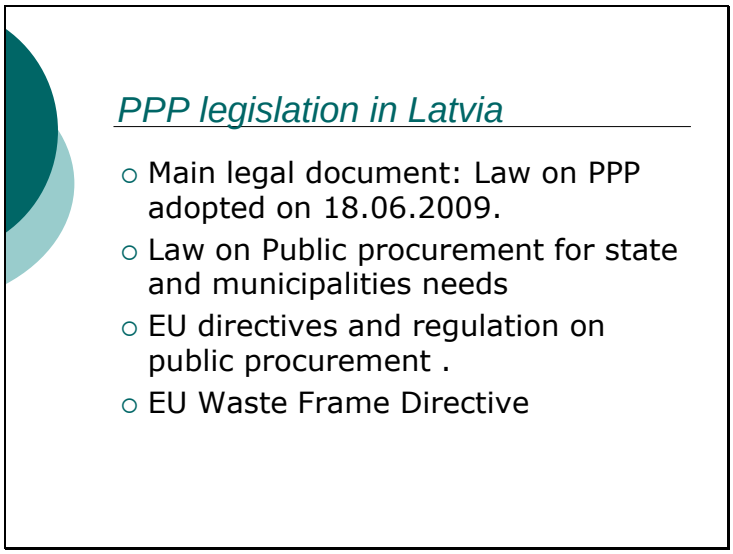

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Situation with PPP in Latvia

- 1991: in process of privatisation, municipalities sold a part of own municipal enterprises.
- 2003: the first case, when municipality handed over a municipal waste collection company to private company in concession for period of 25 years
- 2004-2006: a lot of small companies founded a joint venture with municipalities (today - it is called PPP)

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Diference between companies

We have two main groups:

1. Companies where shares for municipalities is from 5-50 %
2. Companies where shares for municipalities are more than 51 %.
   - Latvian law demands that if a join venture is having shares for public more than 51 % and offer service to more than 80 % municipal inhabitants, the municipality dies not have obligation to organize public procurement procedure in it's teritory, for example for waste collection and transportation.

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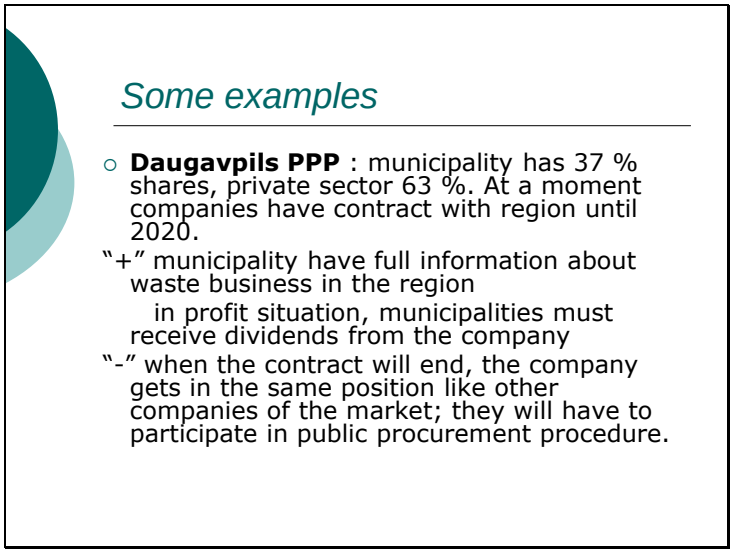

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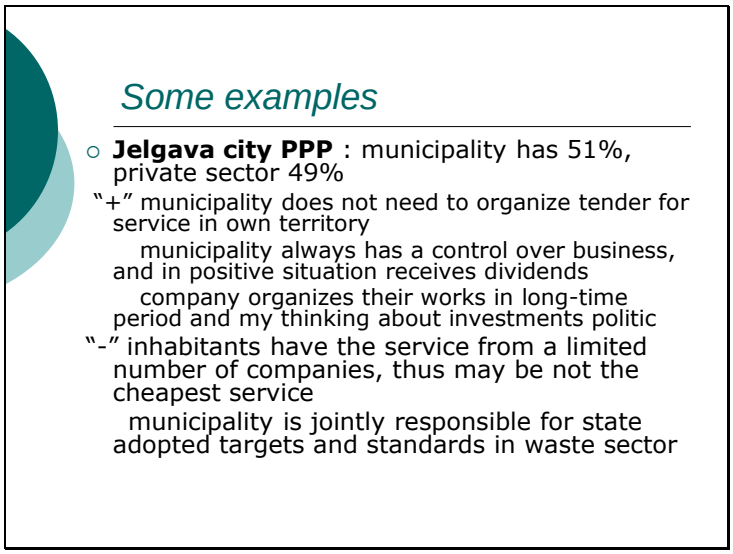

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Ingrida Bremere: From Waste to Energy

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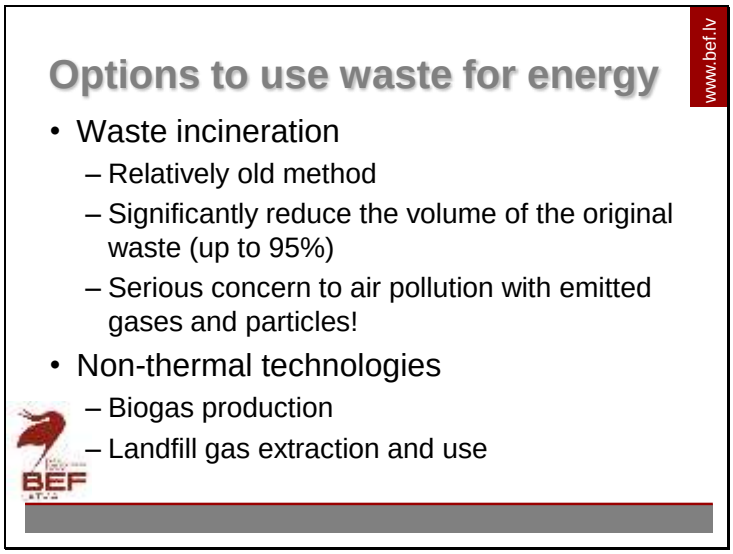
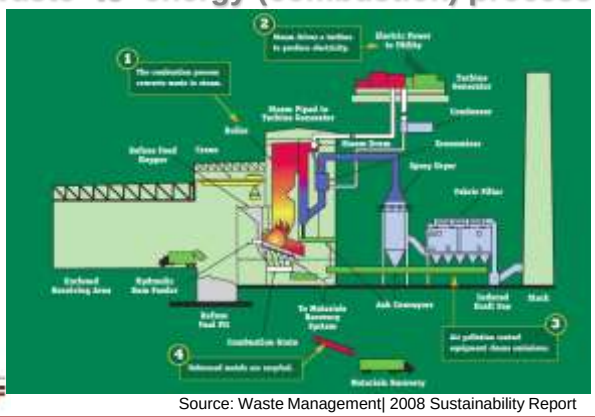


Slide 3

www.bef.lv

Waste -to- energy (combustion) process



Source: Waste Management| 2008 Sustainability Report

Slide 4

www.bef.lv

Landfill as an energy source

- **Production of landfill gas:**
  - Organic/biodegradable waste decomposes under anaerobic conditions
  - Landfill gas is about 40-60% methane (remainder mainly carbon dioxide, but also other compounds and contaminants!)
  - The process is on-going continuously!
- **What can be done with the landfill gas?**
  - Doing nothing leads to release of (methane) gas in atmosphere
  - Collected gas can be used as an energy source

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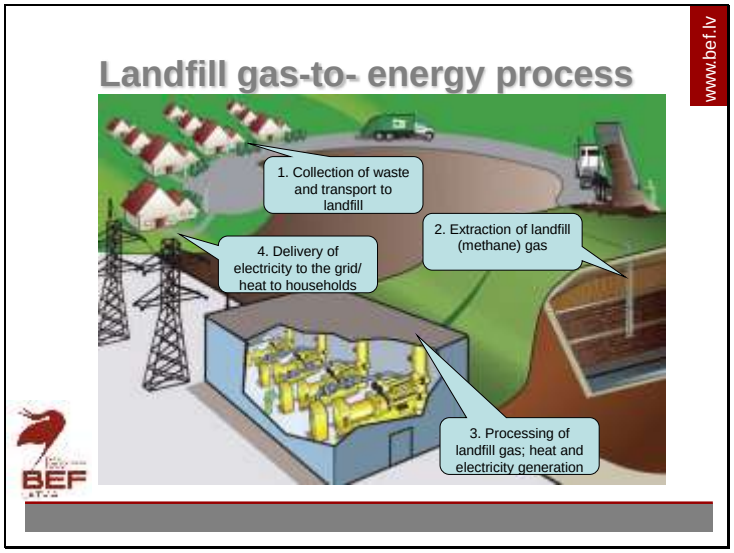

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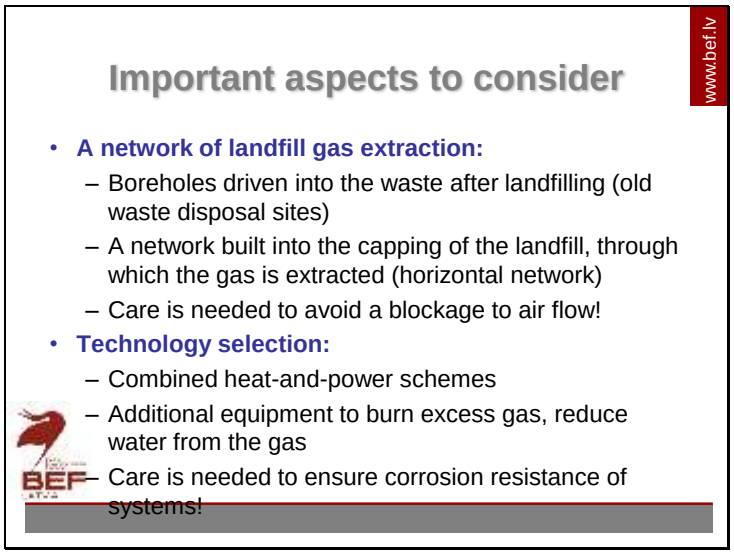

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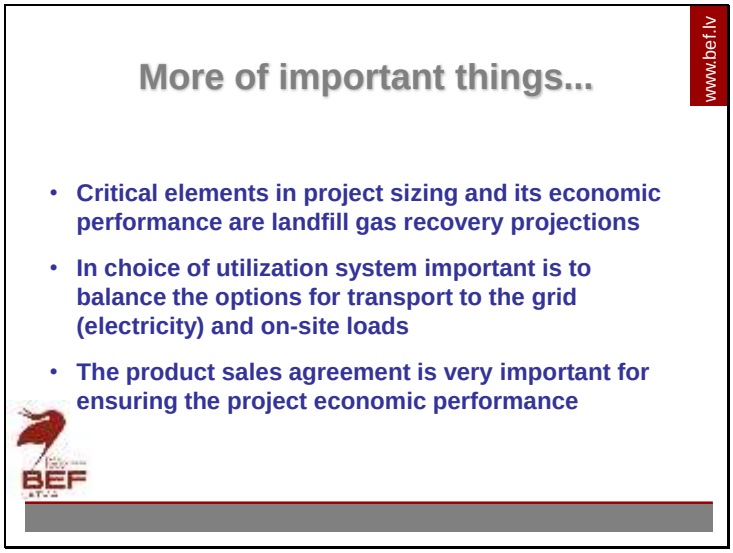
www.bef.lv
More of important things...
• Critical elements in project sizing and its economic performance are landfill gas recovery projections
• In choice of utilization system important is to balance the options for transport to the grid (electricity) and on-site loads
• The product sales agreement is very important for ensuring the project economic performance
BEF

Aivars Sirmais: National legal preconditions for successful land-filling

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Janis Abeltins: Costs of constructing and maintenance of the landfills (Experience from Latvian municipalities)

Slide 1

LATVIAN ASSOCIATION OF WASTE MANAGEMENT COMPANIES

Umwelt Bundes Amt

Geo Consultants

Costs of constructing and maintenance of the landfills
(Experience from Latvian municipalities)

Mr. Jānis Ābeltiņš
Member of the Board of the Latvian association of waste management companies
Member of the Board of "Geo Consultants" Ltd.
14.05.2010.

Slide 2

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EU legislation for constructing and maintainance of the landfills

Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste:

Overall objective (Article 1): To provide measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air, and on the global environment, including the greenhouse effect, as well as any resulting risk to human health, from landfilling of waste, during the whole life-cycle of the landfill.

Waste to be accepted in the different classes of landfill (Article 6): Only waste that has been subject to treatment is landfilled; only hazardous waste that fulfils the criteria set out in accordance with Annex II of Directive is assigned to a hazardous landfill; inert waste landfill sites shall be used only for inert waste.

Control and monitoring procedures in the operational phase (Article 12): According to Annex III of Directive (meteorological data, emission data: water, leachate and gas control), protection of groundwater, topography of the site: data on the landfill body);

Costs (Article 10): Member States shall take measures to ensure that all of the costs involved in the setting up and operation of a landfill site, including as far as possible the cost of the financial security or its equivalent referred to in Article 8(a)(iv), and the estimated costs of the closure and after-care of the site for a period of at least 30 years shall be covered by the price to be charged by the operator for the disposal of any type of waste in that site.

Slide 3

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Landfillings in Latvia in 2010

Slide 4

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Waste landfillings in Latvia

Nr.p.k.	Landfills	Start operation	Served population, thousands of inhabitants	Area of landfill, ha	Capacity of landfill, m3	Construction costs, million EUR
1.	Ventspils	2004	81	15	450 000	5
2.	Liepaja		177	20	600 000	7
3.	North Vidzeme		202	15	800 000	17
4.	Riga	2005	937	80	28 000 000	30
5.	South Latgale	2006	226	10	700 000	7
6.	East Latgale	2007	112	12	540 000	6
7.	Zemgale (2)	2009	194	8	300 000	10
8.	Maliena		86	10	450 000	6
9.	Piejura		162	13	580 000	20
10.	Middle Daugava	2011	129	15	640 000	20
	Total		**2306**	**198**	**33 060 000**	**128**

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LATVIAN ASSOCIATION OF WASTE MANAGEMENT COMPANIES

Geo Consultants

Costs for construction of solid waste landfill in Latvia (Piejura, year 2009)

No	Position	Total, EUR
1.	Outline and Technical design	355 373
2.	External Utilities (roads 1,2 km, comunications)	1 432 286
3.	Landfill cell 5,5 ha with leachate collection and purification system	1 056 937
4.	Inner roads and areas (incl. water supply, sewerage and storm water collection and purification system)	1 727 486
5.	Waste sorting station (sorting equipment, foundations, hangar, other equipment)	1 114 746
6.	Weighing bridge (18 m) including waste registration system	70 000
7.	Other (Fire fighting water basins, Landfill gas utilization system, Ancillary works, planting, fencing, monitoring system)	299 227
	TOTAL	**6 056 055**

The contract involved also construction of 4 solid waste transfer and sorting stations including composting facilities.

Costs:
~2 150 000 EUR per 1 station

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Costs for maintainance of the landfills in Latvia

Region/ landfill	EUR per tonne
Maliena/ Kaudzītes	28,23
Austrumlatgale/ Krīževneiki	27,75
Piejūra/ Janvāri	24,99
Dienvidlatgale/ Demene	22,27
Ziemeļvidzeme/ Daibe	22,13
Liepāja/ Kīvītes	20,75
Ventspils/ Pentuļi	20,70
Bauska/ Grantiņi	18,92
Rīga/ Getliņi	18,50
Jelgava/ Brakšķi	13,57
Average	**21,78**

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LATVIAN ASSOCIATION OF WASTE MANAGEMENT COMPANIES

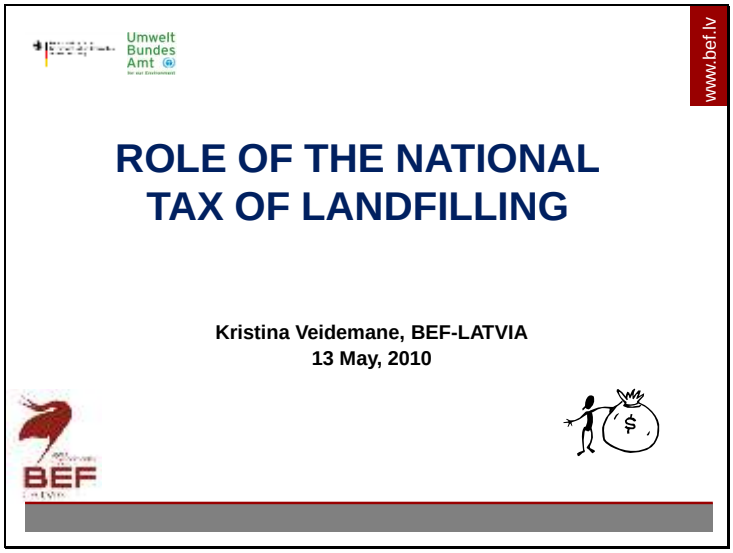
Geo Consultants

Thank you for your attention!

Mr. Jānis Ābeltiņš
"Geo Consultants" Ltd.
Adress: Olivu street 9, LV-1004, Riga, Latvia
Telephone +37167627504, Mobile phone +37129330170, Fax +37167623512
E – mail: janis.abeltins@geoconsultants.lv
Web: www.geoconsultants.lv

Kristina Veidemane: Role of National Landfilling Tax

Slide 1



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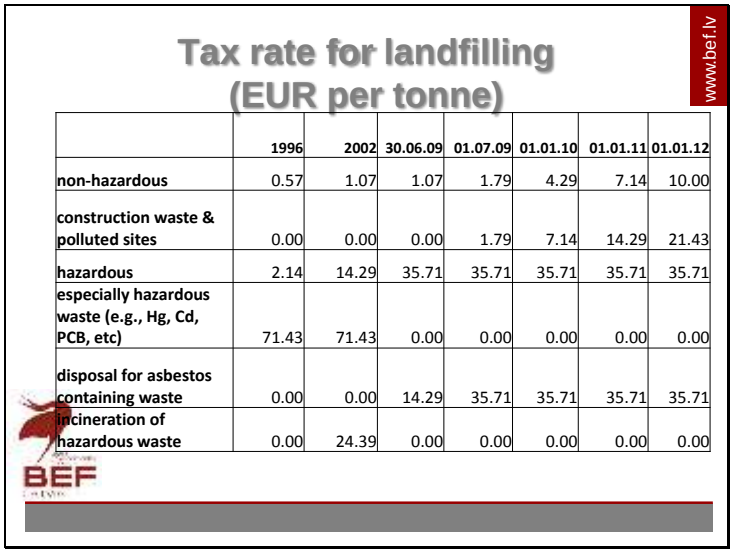

	1996	2002	30.06.09	01.07.09	01.01.10	01.01.11	01.01.12
non-hazardous	0.57	1.07	1.07	1.79	4.29	7.14	10.00
construction waste & polluted sites	0.00	0.00	0.00	1.79	7.14	14.29	21.43
hazardous	2.14	14.29	35.71	35.71	35.71	35.71	35.71
especially hazardous waste (e.g., Hg, Cd, PCB, etc)	71.43	71.43	0.00	0.00	0.00	0.00	0.00
disposal for asbestos containing waste	0.00	0.00	14.29	35.71	35.71	35.71	35.71
incineration of hazardous waste	0.00	24.39	0.00	0.00	0.00	0.00	0.00

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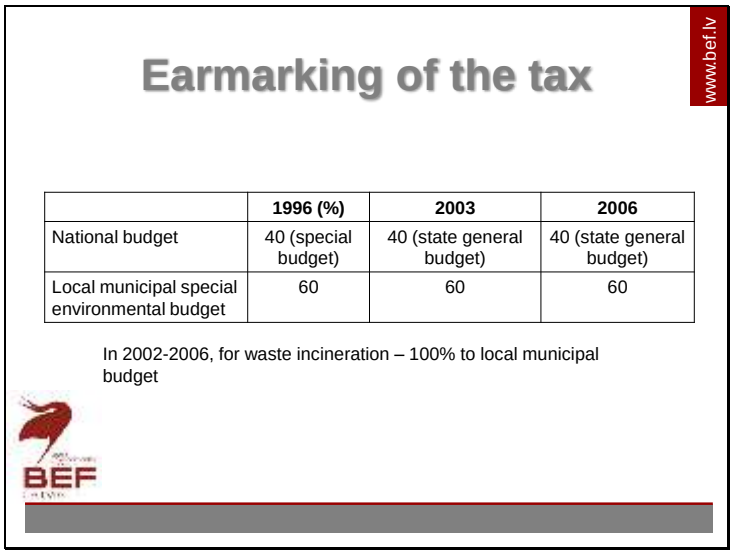

	1996 (%)	2003	2006
National budget	40 (special budget)	40 (state general budget)	40 (state general budget)
Local municipal special environmental budget	60	60	60

In 2002-2006, for waste incineration – 100% to local municipal budget

Mark Lindert: Mechanical-biological treatment

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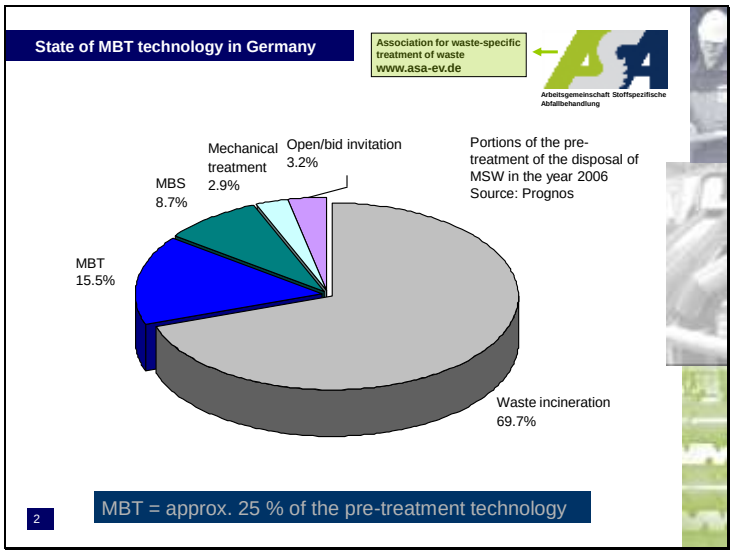

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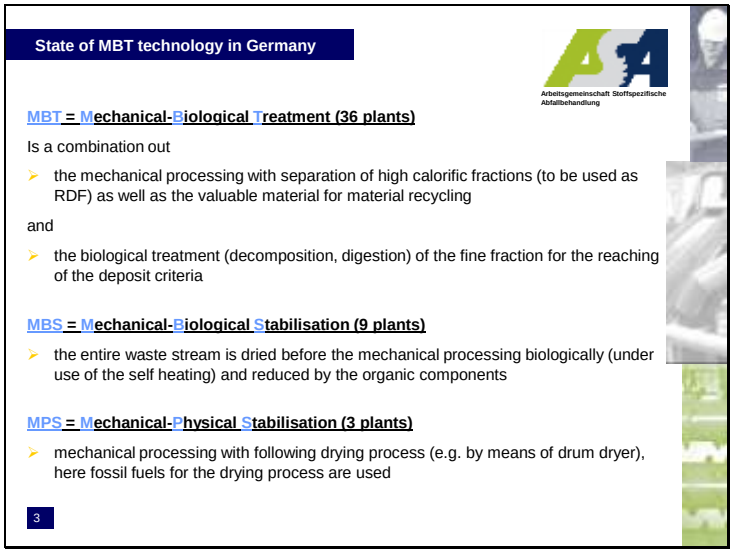

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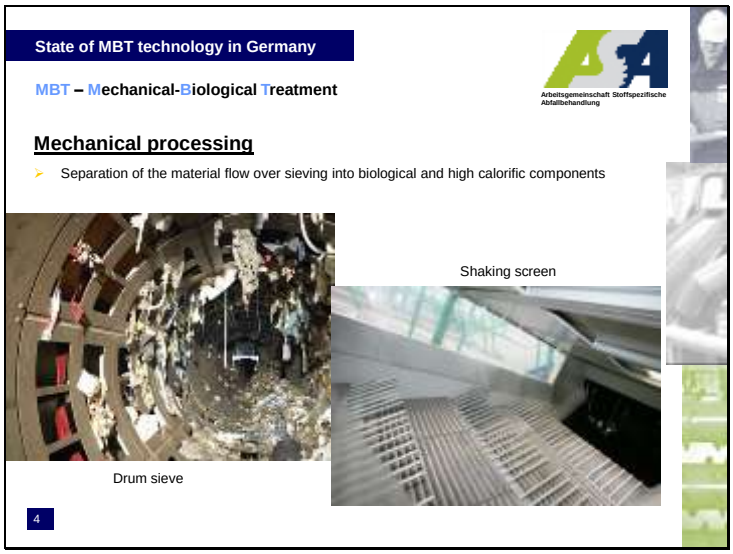

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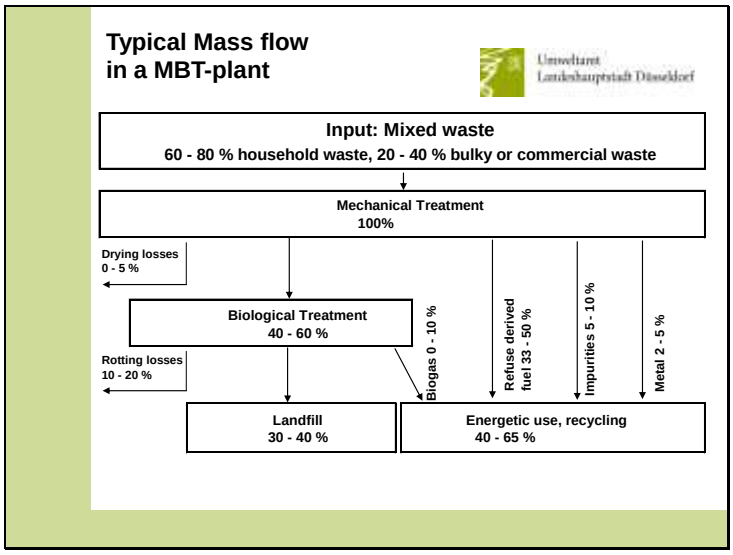

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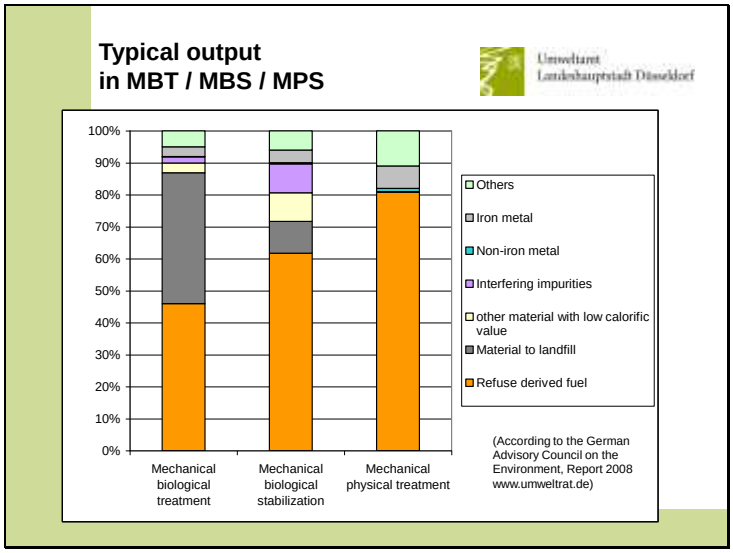

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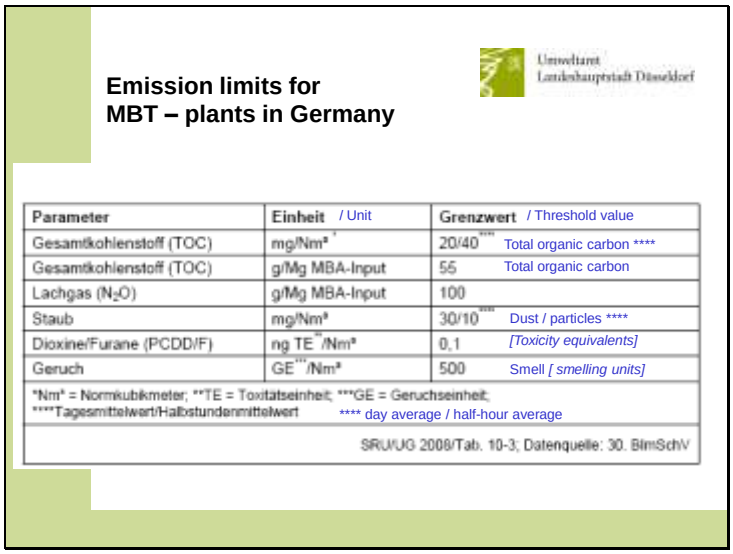
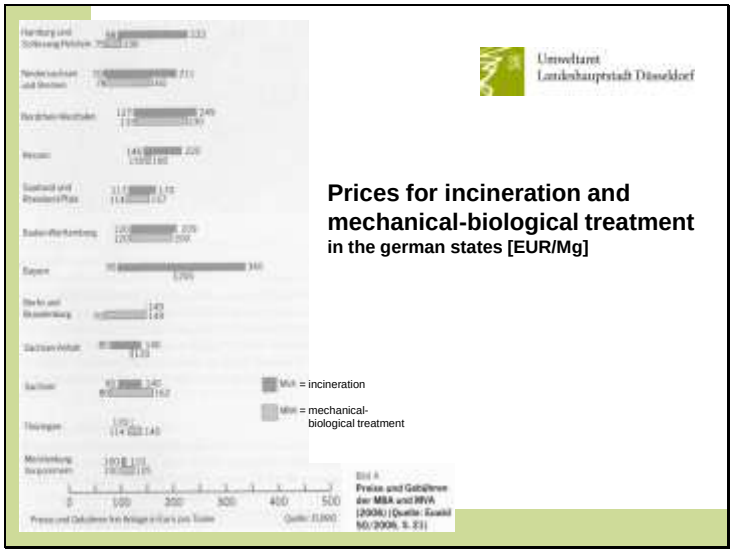


Parameter	Einheit / Unit	Grenzwert / Threshold value
Gesamtkohlenstoff (TOC)	mg/Nm³ *	20/40**** Total organic carbon ****
Gesamtkohlenstoff (TOC)	g/Mg MBA-Input	55 Total organic carbon
Lachgas (N_2O)	g/Mg MBA-Input	100
Staub	mg/Nm³	30/10**** Dust / particles ****
Dioxine/Furane (PCDD/F)	ng TE** /Nm³	0,1 *[Toxicity equivalents]*
Geruch	GE*** /Nm³	500 Smell *[smelling units]*
*Nm³ = Normkubikmeter; **TE = Toxitätseinheit; ***GE = Geruchseinheit; ****Tagesmittelwert/Halbstundenmittelwert **** day average / half-hour average		
SRU/UG 2008/Tab. 10-3; Datenquelle: 30. BImSchV		

Slide 13


Umweltamt
Landeshauptstadt Düsseldorf
Prices for incineration and mechanical-biological treatment
in the german states [EUR/Mg]
MVA = incineration
MBA = mechanical-biological treatment
0
100
200
300
400
500

Aivars Sirmais: Pre-treatment of Waste at the Landfill

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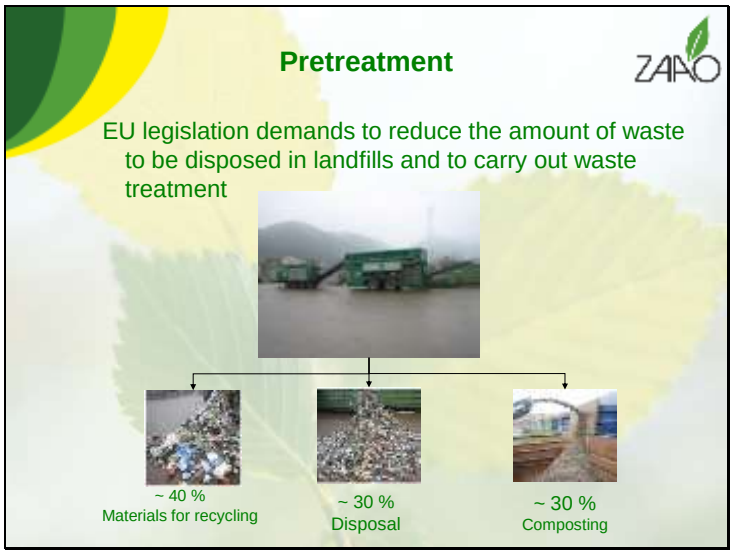

Slide 5

Slide 6

Kristina Veidemane: EU targets on landfilling of municipal waste (Considering recycling and recovery)

Slide 1

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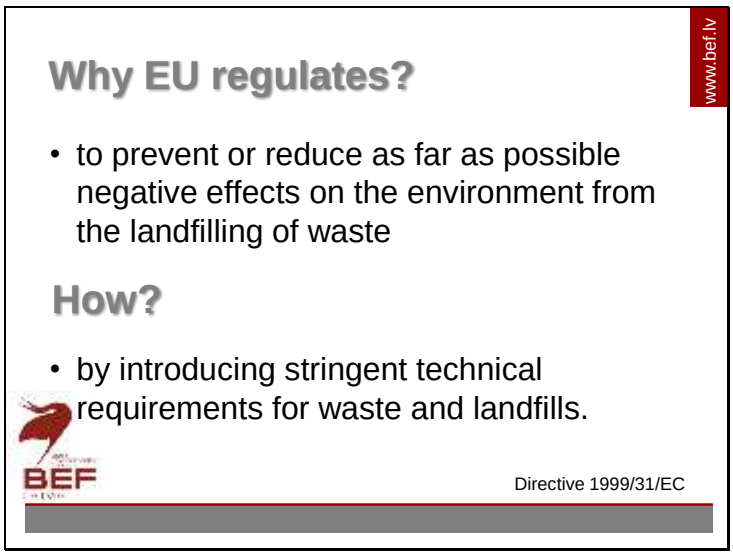

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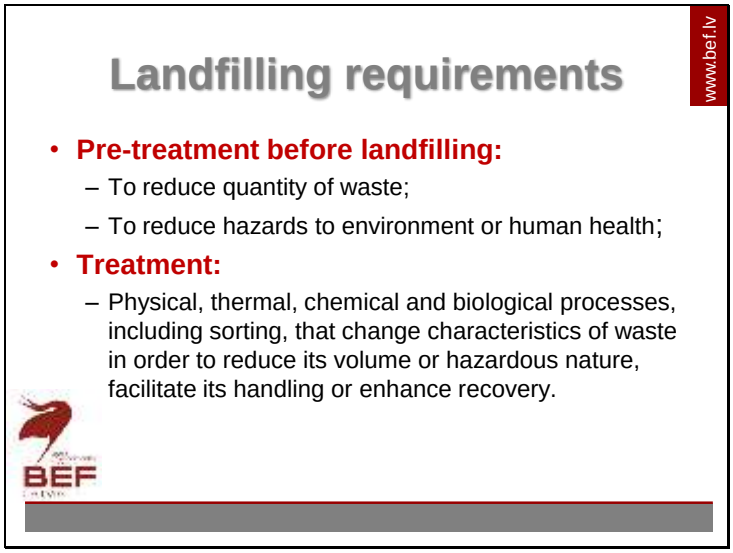

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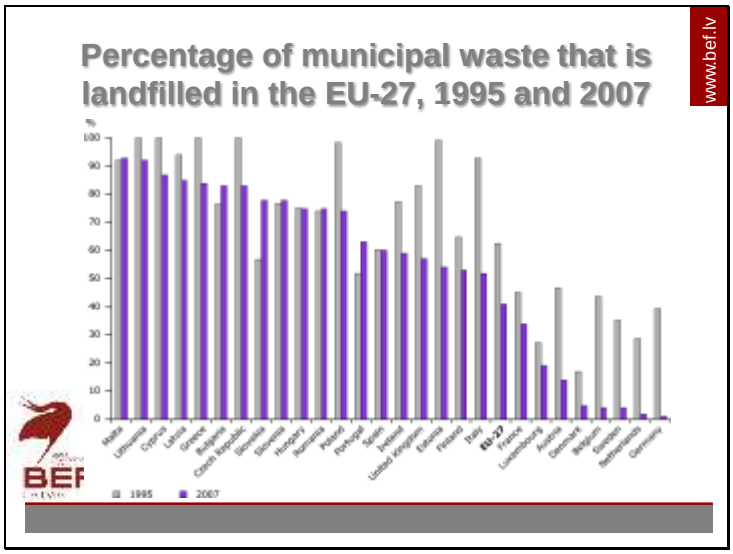

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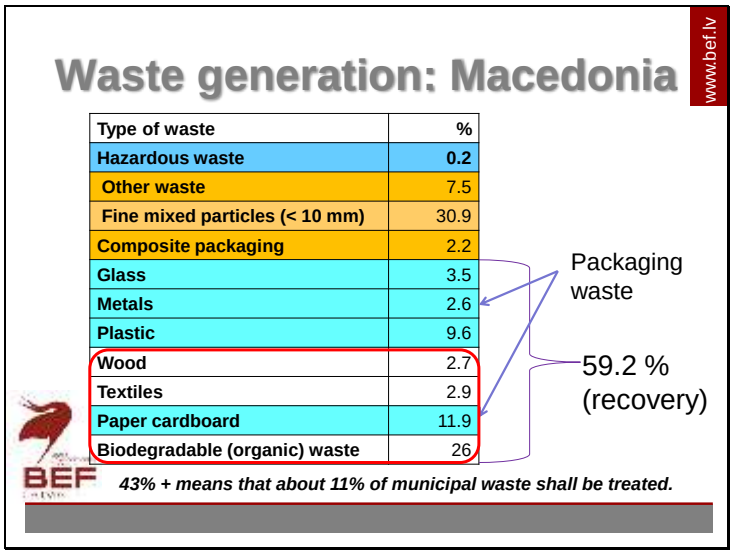

Armands Nikolajevs: Different actors and share of market in waste collection

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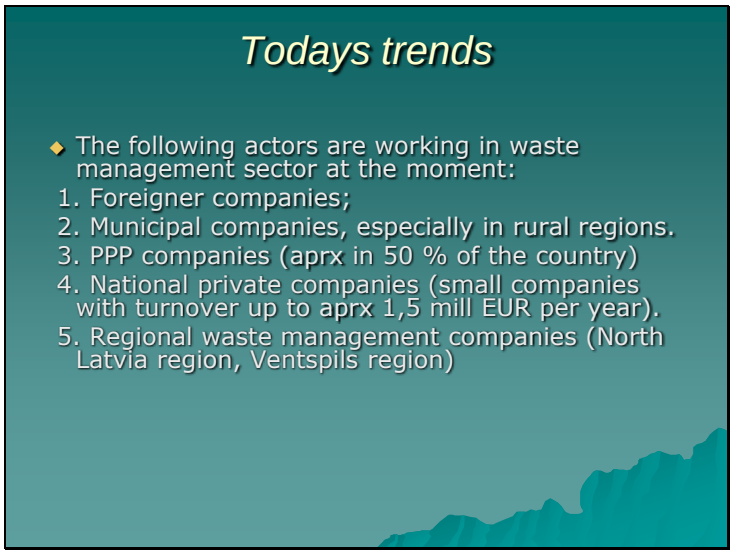

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Important facts

- Municipalities need to decide which model for waste collection and transportation in their region is most suitable.
- Municipalities need to be involved in waste management process. Then they follow and are in charge of the result. The waste is generated in their territory by their inhabitants.
- It is very common to set apart household waste management from the rest of municipal waste streams. However, it can turn out that You pay twice for the works, which you could actually avoid.
- Experience shows, that it has been beneficial to establish regional companies This might be useful for your region when discussing the future of the sector.

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Aivars Sirmais: Requirements for an efficient waste collection system

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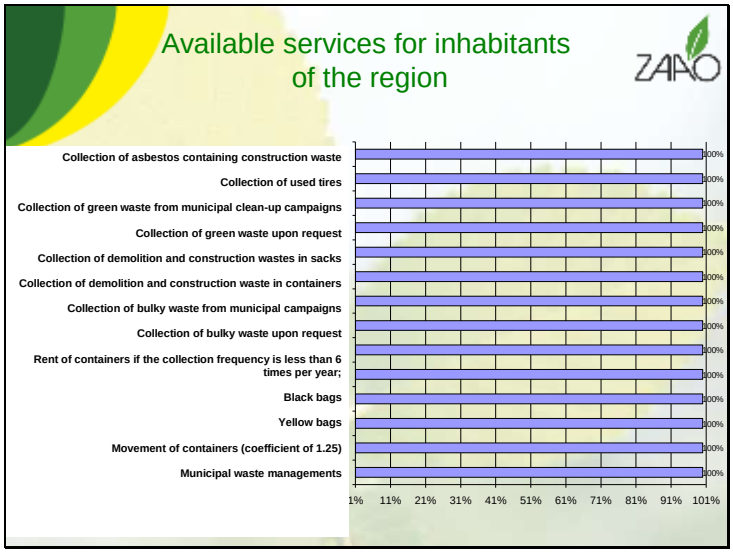

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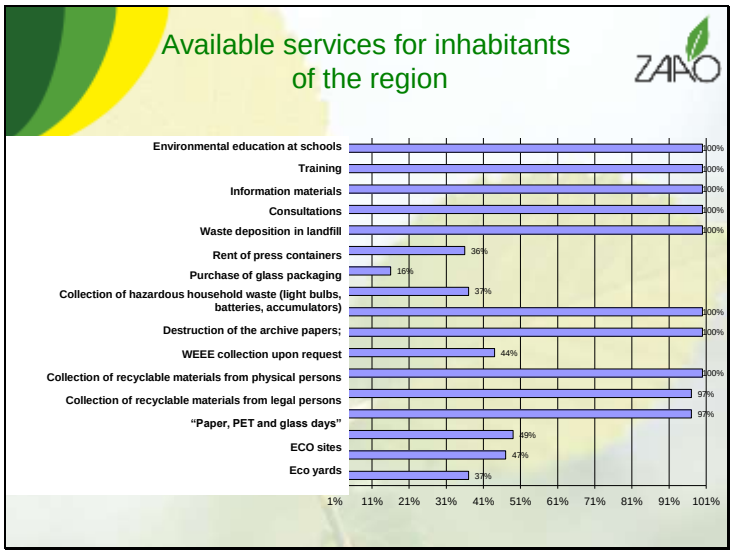

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Code	Waste type	Fee (EUR/tone)
200301	Mix household waste and similar to hosuehold waste	24.71
200201	Garden and park waste	10.00
170107	Sorted construction waste	7.14
170904	Mixed construction waste	21.43

Mark Lindert: Costs for waste collection, costs positions for the fee, contracts with the companies

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Contracts with Waste Management Companies:

Umweltamt Landeshauptstadt Düsseldorf

Considering, if needed or convenient:

- **Detailed guideline / description for services**
- **Specific prices, e.g.:**
  Emptying garbage containers, 60 l - 240 l
  103.001 - 108.000: xx EUR / a
  98.001 - 103.000: xy EUR / a
  93.001 - 98.000: yy EUR / a
- **Quality standards**
- **Penalty if service is not carried out properly**
- **Short validity of contract (about 3 - 5 years)**

Slide 4

How specific should the catalogue be?

Umweltamt Landeshauptstadt Düsseldorf

Does the company empty every container on agreed schedule?

Does contract include cleaning around containers? What about „wild heaps“ of waste?

Dilemma:

If not specified, company might try to get extra money in every case „outside of the contract“

If generally specified, the contract will be more expensive from the beginning („allround carefree-package“)

Slide 5

Quality criteria:

Umweltamt Landeshauptstadt Düsseldorf

Are the locations of waste containers clean / cleaned according to agreed schedule?

(maybe expensive when additional emptying is necessary)

Agreement on cleaning according „to necessity“?

(more flexible, maybe less expensive, but municipality needs to control more often)

Slide 6

Umweltamt Landeshauptstadt Düsseldorf

„Dividing Lines“ between contracts

Always a topic in negotiating contracts:

Limits of responsibility

E.g. (Germany): Places for Containers for glass and paper:

Company A: Emptying glass containers, tendered by DSD („green dot“), harmonized with specifications drawn up by municipality

Company B: Emptying paper containers and cleaning the whole site, tendered by municipality

Slide 7

Payment for disposal of collected waste:

Umweltamt Landeshauptstadt Düsseldorf

Possibilities:

- **Payment according to weight (tonnage)**

  Fixed price / t over contract-time or escalator-clause (e.g rate of inflation)?

  Pollutants in waste fractions to be recycled: Increasing price?

- **Fixed price, not dependant on weight (under circumstances: paying reserve capacity)**

Slide 8

Contracts may contain regulations about:

Umweltamt Landeshauptstadt Düsseldorf

Public relations /
Customer information about dealing with waste:
- **adjusting information about the work of different companies**
- **layout, printing, delivery**
- **influence of municipality**

Collection of fees / charges:
- **by company?**
- **regular reports of company concerning cash-flow?**

Control of cash-flow
- **right to check the ledgers?**
- **municipality hires chartered accountant to audit the work of the company? company pays?**

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Kalkulation der Abfallgebühren 2010

Erträge:	Ansatz in Euro
Gebühren und Entgelte für Müllabfuhr	79.246.942
Umsatzerlöse für Schrott, Altkleider, Papier etc	2.987.346
Zuschuss aus Gebührenausgleichsrücklage	6.099.722
Summen:	88.334.010

Aufwand:	Ansatz in Euro
Personalaufwendungen des Umweltamtes (incl. Pensionsrückstellungen)	881.000
Aufwendungen + Rückstellungen für Sanierung von Altdeponien	1.280.000
Erstattungen an IDR für Haushaltsondermüllsammlung	955.200
Erstattungen an AWISTA für Sickerwasser (Altteil)	1.700.000
Erstattung an AWISTA für Leistung Abfallentsorgung ohne Biotonne	79.322.136
Erstattung an AWISTA für Leistung Abfallentsorgung Biotonne	2.201.511
Aufwendungen für Unterhaltung der Dienstfahrzeuge des Umweltamtes	2.044
Entsorgungssonderleistungen	20.000
Zuschuss an die Verbraucherzentrale für Abfallberatung	62.658
Besondere Aufwendungen für Beschäftigte z.B. Fortbildung	2.600
Kosten für Gutachten / Analysen	40.000
Geschäftsausgaben z.B. Porto- und Telefongebühren	38.612
Beitrag für Gemeindeunfallversicherung	1.646
Abschreibungen auf Inventar	9.391
Soft- und Hardwarebetreuung (incl. Lizenzen, Leasing) durch Amt 10	26.000
Aufwendungen für Telekommunikation (z.B. Leasing) durch Amt 10	2.000
Dienstleistung des Personalamtes für Umweltamt z.B. Gehälterzahlung	8.100
Dienstleistungen der Stadtkasse z.B. Mahnung und Vollstreckung	16.100
Mieten und Betriebskostenvorauszahlung für Dienstgebäude	191.180
Rechtsberatungen und -gutachten des Rechtsamtes	8.000
Leistung des Gartenbauamtes, des Rechnungsprüfungsamtes, der Kämmerei und des Gesundheitsamt	1.564.812
Zuführung zur Gebührenausgleichsrücklage	0
Kalkulatorische Zinsen für Inventar	1.020
Summen:	88.334.010

Umweltamt
Landeshauptstadt Düsseldorf

Costs 2010

e.g.:

Savings for remediation of landfills

Treatment of landfill leachate

Collecting waste in public parks

Slide 10

Committed prices
for different services

Umweltamt
Landeshauptstadt Düsseldorf

Job	Amount	Price
Restmüll 60-240 l TS	6.301- 7.300 Leerungen/w	€/a
Restmüll 60-240 l TS	5.301- 6.300 Leerungen/w	€/a
Restmüll 60-240 l TS	4.301- 5.300 Leerungen/w	€/a
Restmüll 60-240 l TS E		€
Restmüll 60-240 l VS	103.001-108.000 Leerungen/w	€/a
Restmüll 60-240 l VS	98.001-103.000 Leerungen/w	€/a
Restmüll 60-240 l VS	93.001-98.000 Leerungen/w	€/a
Restmüll 60-240 l VS	88.001-93.000 Leerungen/w	€/a
Restmüll 60-240 l VS E		€
Restmüll 660-1100 l VS	11.501-12.500 Leerungen/w	€/a
Restmüll 660-1100 l VS	10.501-11.500 Leerungen/w	€/a
Restmüll 660-1100 l VS	9.501-10.500 Leerungen/w	€/a
Restmüll 660-1100 l VS E		€
Restmüll > 1100 l VS	40-49 Leerungen/w	€/a
Restmüll > 1100 l VS	30-39 Leerungen/w	€/a
Restmüll > 1100 l VS	20-29 Leerungen/w	€/a
Restmüll > 1100 l VS	10-19 Leerungen/w	€/a
Restmüll > 1100 l VS E		€
Bioabfallsammlung 120-240 l TS alt	10.001-12.000	€/a
Bioabfallsammlung 120-240 l TS alt	8.001-10.000	€/a
Bioabfallsammlung 120-240 l TS alt	6.001-8.000	€/a
Bioabfallsammlung 120-240 l VS	301-360	€/a
Bioabfallsammlung 120-240 l VS	221-300	€/a
Bioabfallsammlung 120-240 l VS	141-220	€/a
Bioabfallsammlung 120-240 l VS	66-140	€/a
Bioabfallsammlung 120-240 l VS	1-65	€/a
VS Ergänzung Biotonne		€/Leerung/a
Bioabfallsammlung Entleerung		€
mobil Grünschnittsammlung Frühjahr /Herbst alt	bei 545 t/a	€
mobil Grünschnittsammlung Frühjahr /Herbst neu		€/Stand
mobil. Grünschnitt Entsorgung		€
Mobile Sammlung Ersatztonne	Derendorf, Oberkassel, Gerresheim	€/Stand
Mobile Sammlung Ersatztonne E		€
Mobile Sammlung Ersatztonne	Hamm	€/Stand
Mobile Sammlung Ersatztonne E		€
Weihnachtsbaumsammlung		€/a
Weihnachtsbaumsammlung E		€
Sperrmüll Standard alt	bei 21.731 t/a	€
Sperrmüll Standard/Altholz neu	bei 22.019 t/a	€
Sperrmüll Standard E		€
Sperrmüll Altholz E		€
Sperrmüll cartalore E		€
Sperrmüll Altholz cartalore E		€
Sammlung Elektrogeräte		€/a
Sammlung Elektrogeräte E		
Abkleidersammlung		€/a
Schadstoffmobil		€/a
Schadstoffsammlung an Samstagen		€/Stand

Job	Amount	Price
Restmüll 60-240 l TS	6.301- 7.300 Leerungen/w	€/a
Restmüll 60-240 l TS	5.301- 6.300 Leerungen/w	€/a
Restmüll 60-240 l TS	4.301- 5.300 Leerungen/w	€/a
Restmüll 60-240 l TS E		€
Restmüll 60-240 l VS	103.001-108.000 Leerungen/w	€/a
Restmüll 60-240 l VS	98.001-103.000 Leerungen/w	€/a
Restmüll 60-240 l VS	93.001-98.000 Leerungen/w	€/a
Restmüll 60-240 l VS	88.001-93.000 Leerungen/w	€/a
Restmüll 60-240 l VS E		€
Restmüll 660-1100 l VS	11.501-12.500 Leerungen/w	€/a
Restmüll 660-1100 l VS	10.501-11.500 Leerungen/w	€/a
Restmüll 660-1100 l VS	9.501-10.500 Leerungen/w	€/a
Restmüll 660-1100 l VS E		€
Restmüll > 1100 l VS	40-49 Leerungen/w	€/a
Restmüll > 1100 l VS	30-39 Leerungen/w	€/a
Restmüll > 1100 l VS	20-29 Leerungen/w	€/a
Restmüll > 1100 l VS	10-19 Leerungen/w	€/a
Restmüll > 1100 l VS E		€
Bioabfallsammlung 120-240 l TS alt	10.001-12.000	€/a
Bioabfallsammlung 120-240 l TS alt	8.001-10.000	€/a
Bioabfallsammlung 120-240 l TS alt	6.001-8.000	€/a
Bioabfallsammlung 120-240 l VS	301-360	€/a
Bioabfallsammlung 120-240 l VS	221-300	€/a
Bioabfallsammlung 120-240 l VS	141-220	€/a
Bioabfallsammlung 120-240 l VS	66-140	€/a
Bioabfallsammlung 120-240 l VS	1-65	€/a
VS Ergänzung Biotonne		€/Leerung/a
Bioabfallsammlung Entleerung		€
mobil Grünschnittsammlung Frühjahr /Herbst alt	bei 545 t/a	€
mobil Grünschnittsammlung Frühjahr /Herbst neu		€/Stand
mobil. Grünschnitt Entsorgung		€
Mobile Sammlung Ersatztonne	Derendorf, Oberkassel, Gerresheim	€/Stand
Mobile Sammlung Ersatztonne E		€
Mobile Sammlung Ersatztonne	Hamm	€/Stand
Mobile Sammlung Ersatztonne E		€
Weihnachtsbaumsammlung		€/a
Weihnachtsbaumsammlung E		€
Sperrmüll Standard alt	bei 21.731 t/a	€
Sperrmüll Standard/Altholz neu	bei 22.019 t/a	€
Sperrmüll Standard E		€
Sperrmüll Altholz E		€
Sperrmüll cartalore E		€
Sperrmüll Altholz cartalore E		€
Sammlung Elektrogeräte		€/a
Sammlung Elektrogeräte E		
Abkleidersammlung		€/a
Schadstoffmobil		€/a
Schadstoffsammlung an Samstagen		€/Stand

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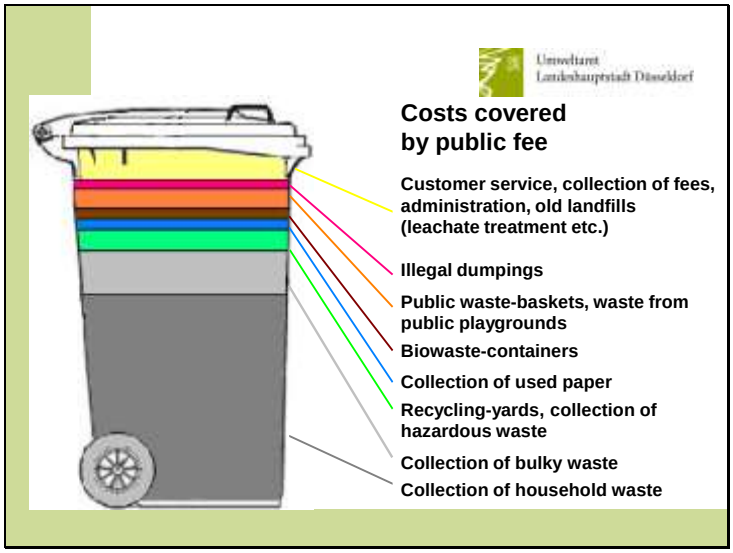

Slide 12

Janis Abeltins: Closing of the old dump-sites (Experience from Latvian municipalities)

Slide 1

LATVIAN ASSOCIATION OF WASTE MANAGEMENT COMPANIES

Umwelt Bundes Amt

Geo Consultants

Closure of the old dumpsites (Experience from Latvian municipalities)

Mr. Jānis Ābeltiņš
Member of the Board of the Latvian association of waste management companies
Member of the Board of "Geo Consultants" Ltd.
14.05.2010.

Slide 2

LATVIAN ASSOCIATION OF WASTE MANAGEMENT COMPANIES

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EU legislation for the closure of the old dumpsites

Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste:
Article 13 "Closure and after-care procedures":

-Closure procedure is started under the authorisation of the competent authority, at the request of the operator or by reasoned decision of the competent authority;

-a landfill or part of it may only be considered as definitely closed after the competent authority has carried out a final on-site inspection, has assessed all the reports submitted by the operator and has communicated to the operator its approval for the closure;

-after a landfill has been definitely closed, the operator shall be responsible for its maintenance, monitoring and control in the after-care phase for as long as may be required by the competent authority, taking into account the time during which the landfill could present hazards;

-the operator shall notify the competent authority of any significant adverse environmental effects;

-the operator of the site shall be responsible for monitoring and analyzing landfill gas and leachate from the site and the groundwater regime in the vicinity of the site (in accordance with Directives' Annex III).

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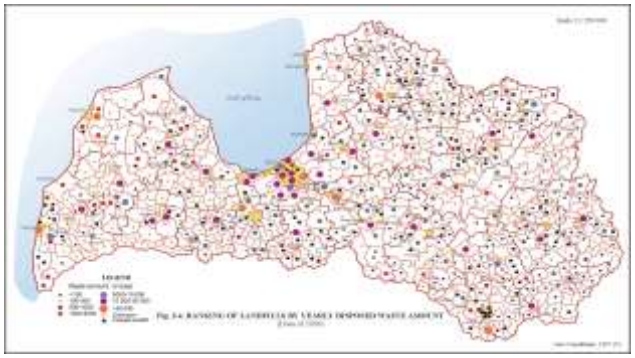
Dumpsites in Latvia in 2006



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Dumpsites in Latvia

Year	Amount of dumpsites
1998	558
2003	191
2004	148
2005	109
2006	99
2007	84
2009	50

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Landfillings in Latvia in 2010

Slide 6

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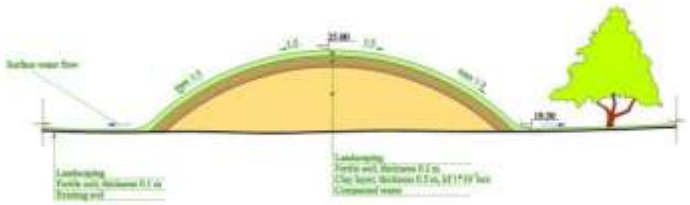
Applicable methods for dumpsites recultivation in Latvia

1. Recultivation on site;
2. Site clean-up (removing of existing waste to other dumpsite or landfill);
3. Rehabilitation/ remediation on site.



Standart section after dumpsite recultivation

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Technical steps have to be taken for old dumpsites closure

1. Investigation of the existing situation;
2. Determination of a contamination;
3. Planning and designing of closure activities;
4. Works (compacting and sloping; covering by clay and soil layer; landscaping);
5. Monitoring (30 years after closure).

Slide 8

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Recultivation/ remediation costs depends on:

1. Dumpsite area;
2. Disposed waste amount and composition;
3. Geographical location (availability of material for recultivation);
4. Level of soil and groundwater contamination.

The most expensive are remediation works, but recultivation and site clean-up works are essentially cheaper. Actual costs of site clean-up works depends on waste amount and distance for what waste has to be transported.

Average costs are 30000-100000 EUR per ha.

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Production of biogas in old dumpsites:

Main factors that influence production of biogas in old dumpsites:

1. Age of dumpsite (start and end time of waste operation);
2. Waste amount and composition;
3. Area of dumpsite and thickness of waste layer.

General assumptions for production of biogas:

From 1 t household waste it's possible to get ~ 100 – 140 Nm^3 total methane (CH_4), maximal methane amount (from total) that can be collected is ~ 30-50% (during the process of decomposition).

From 500 Nm^3 (at CH_4 50%) methane it's possible to get ~1,0 MW electric energy and ~1,2 MW thermal energy.

One of the ways to calculate the collected amount of methane (CH_4) is as follows:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_0 \left(\frac{M_i}{10}\right) e^{-kt_{ij}}$$

Where,
Q_{CH4} = annual methane generation in the year of the calculation (m^3/year)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate ($year^{-1}$)
L_0 = potential methane generation capacity (m^3/Mg)
M_i = mass of waste accepted in the i^{th} year (Mg)
t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

Slide 10

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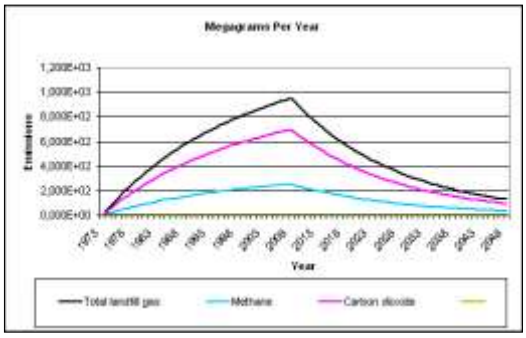
Dinamics of formation of biogas versus time:



Incomes depend on sold amount of electric energy and thermal energy (for example, in Latvia the price of renewable energy is ~ 0,18 EUR/kWh).

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Landfills and dumpsites in Latvia where biogas has been collected and sold :

No.	Landfill	Total incomes from sold electric energy in 2009, EUR	Notes
1.	North Vidzeme (Daibe)	142 000	In 6 months (year 2009)
2.	Riga (Getliņi)	2 560 000	
3.	Liepaja (Kivītes)	260 000	
Soon planned in:			
1.	Piejura		Planned production from year 2013; planned capacity - till 1,0 MW
2.	Zemgale		Planned production from year 2013; planned capacity - till 1,0 MW
3.	East Latgale		Planned production from year 2012; planned capacity - till 0,5 MW
4.	South Latgale		Planned production from year 2012; planned capacity - till 1,0 MW
No.	**Recultivated dumpsites**	**Total incomes from sold electric energy in 2009, EUR**	**Notes**
1.	South Latgale (Demene)		Planned production from year 2011; planned capacity - till 0,4 MW
2.	Ventspils (Platene)		Only gas burning
3.	Liepaja (Šķēde)	85 000	
4.	Zemgale (Brakšķi)		Planned production from year 2011; planned capacity - till 0,5 MW
5.	Piejura (Janvāri)		Planned production from year 2013; planned capacity - till 0,5 MW
6.	Riga region, Ogre (Kļūpe)		Planned production from year 2012; planned capacity - till 0,3 MW

Slide 12

LATVIAN ASSOCIATION OF WASTE MANAGEMENT COMPANIES

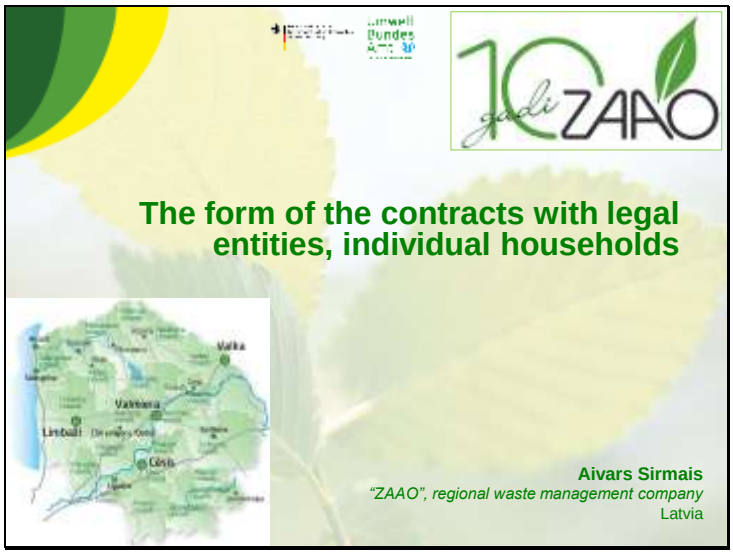
Geo Consultants

Thank you for your attention!

Mr. Jānis Ābeltiņš
"Geo Consultants" Ltd.
Adress: Olivu street 9, LV-1004, Riga, Latvia
Telephone +37167627504, Mobile phone +37129330170, Fax +37167623512
E – mail: janis.abeltins@geoconsultants.lv
Web: www.geoconsultants.lv

Aivars Sirmais: Forms of the contracts with legal entities, individual households

Slide 1



Slide 2

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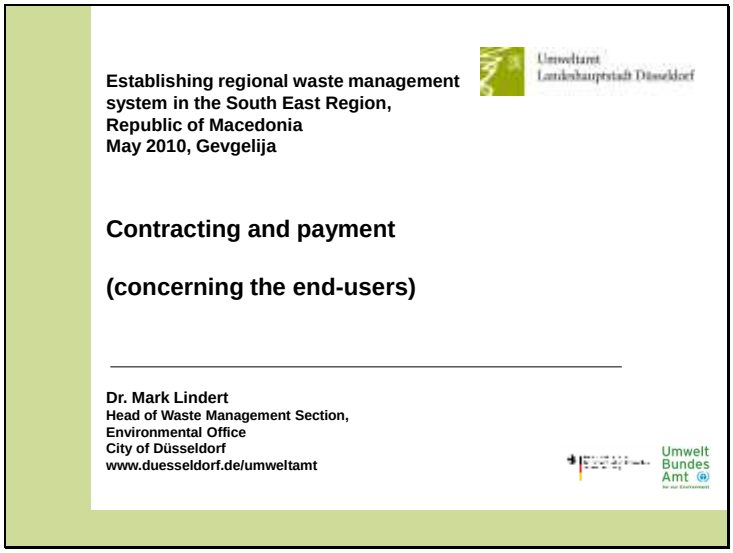
Slide 4

Mark Lindert: Contracting and payment (concerning the end-users)

Slide 1



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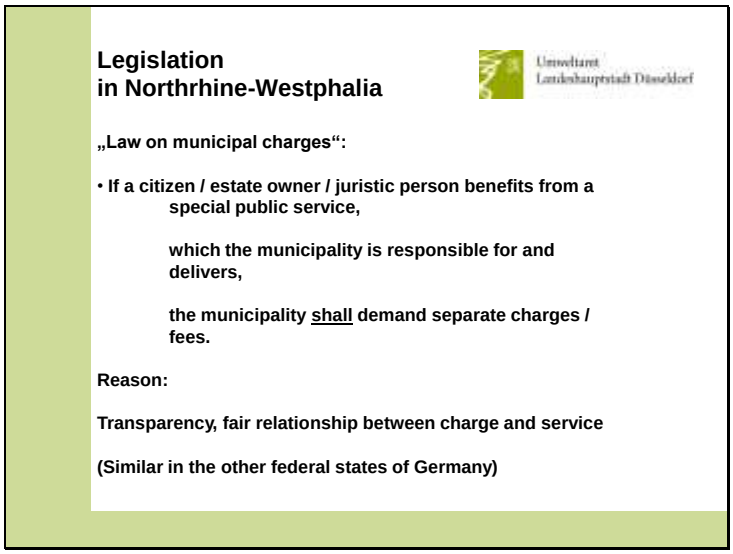

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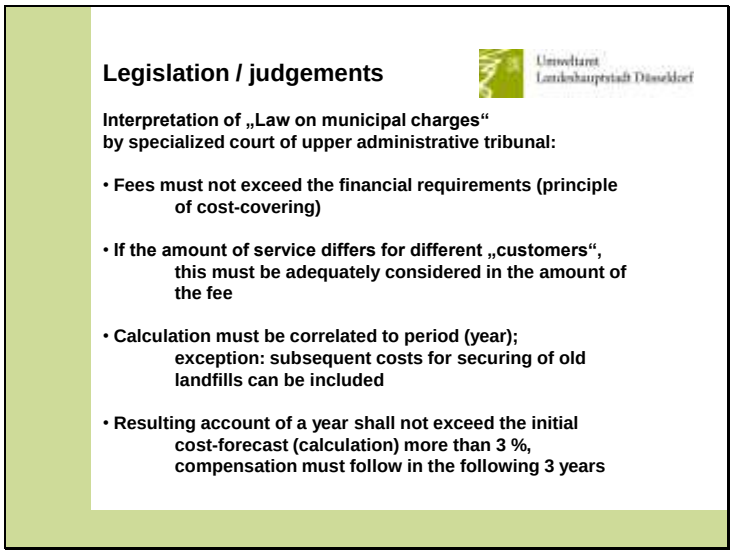


Slide 5

Legislation in Northrhine-Westphalia

Umweltamt Landeshauptstadt Düsseldorf

„Waste Management Law“:

- **Municipalities may collect charges for their waste management services**
- **System of charges shall motivate citizens to avoid production of waste or to separate waste to be recovered (stimulus)**
- **System of charges shall specially motivate citizens to perform private composting**

Slide 6

Essential regulations in Düsseldorf´s waste management statutes

Umweltamt Landeshauptstadt Düsseldorf

1.
Every real estate with private household(s) has to accept and use municipal waste-containers (volume between 60 litres and 4.500 litres).

2.
The owner of the real estate has to make sure that the containers are large enough for any household waste that can not be brought to the municipal recovery facilities.

Slide 7

Essential regulations

in Düsseldorf´s waste management statutes

Umweltamt Landeshauptstadt Düsseldorf

3.
The owner has to order at least a volume of 20 litres per week for each person living on the real estate.

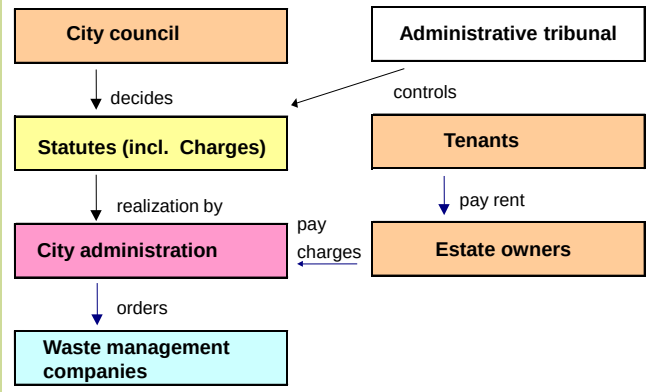
4.
This minimum volume may be reduced to 15 litres if the owner orders a separate container for biowaste or composts any compostable waste on the estate for himself (stimulus).

5.
The containers (for rest-waste) will usually be emptied once a week, on application, emptying more or less often can be permitted.

Slide 8

Fees for household waste management and street cleaning

Umweltamt Landeshauptstadt Düsseldorf



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Umweltamt
Landeshauptstadt Düsseldorf

Düsseldorf´s model of defrayment of costs in waste management:

Calculating a basis fee (covering at least a part of the fix-costs) for each container for household waste / residual waste

Adding a volume-based fee

Reduction of the fee for partial service (curbside collection) and self-composting

Surcharge for „cellar-service“

Slide 10

Umweltamt
Landeshauptstadt Düsseldorf

Calculation of fees for biowaste containers

Considering costs for:

- **emptying containers,**
- **transport**
- **composting of biowaste**

- **Fee: costs divided on litres (volume of containers)**

Slide 11

Special fees

Umweltamt
Landeshauptstadt Düsseldorf

Special fees / charges
for services exceeding the „standard level of service“:

- **for collecting bulky waste of amounts larger than 2 m³**
- **for polymer-sacks that can be used to dispose of extra-amounts of household-waste**
- **for household- or bulky waste delivered to the recycling yard**
- **for specially secured containers for medical waste**

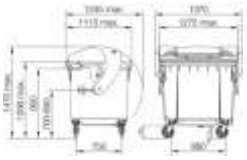
Slide 12

Special service and information

Umweltamt
Landeshauptstadt Düsseldorf

For large dwelling house companies and their tenants:

- **Continuous presence of service personell to keep the premises clean and inform about waste separation**
- **Optimizing number and volume of the different waste containers → lowering fees**
- **Possibly contracting about financing the reconstruction of container-points**



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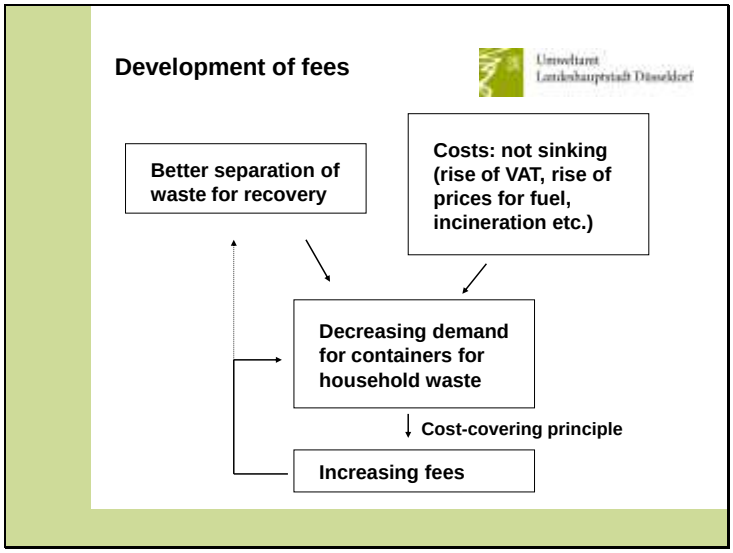


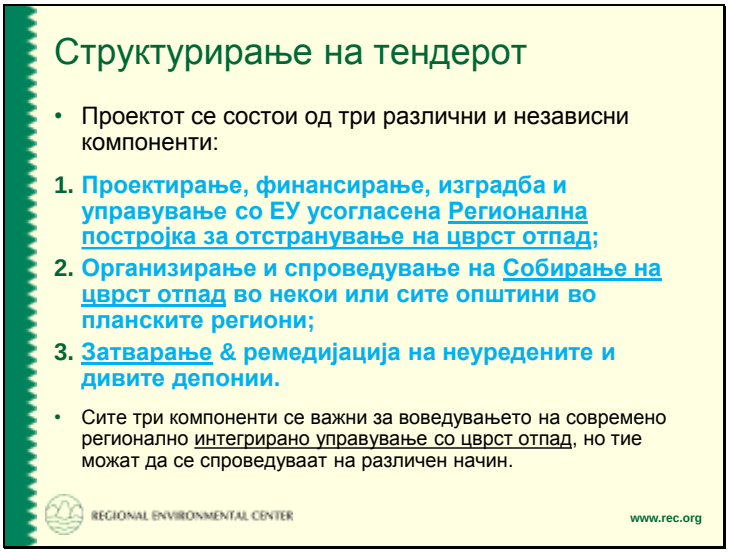
Slide 14

Presentations: Second Workshop (Sep 2010)

A. Petrovska: Scope of joint municipal operations

Slide 1

Slide 2



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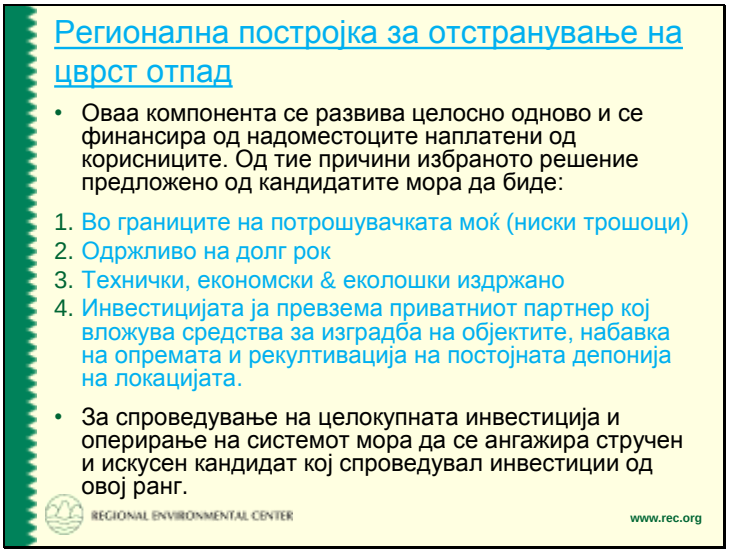

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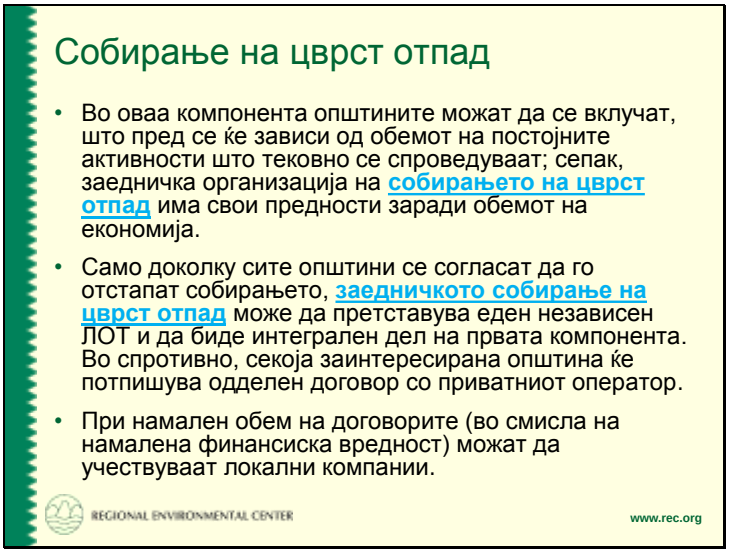

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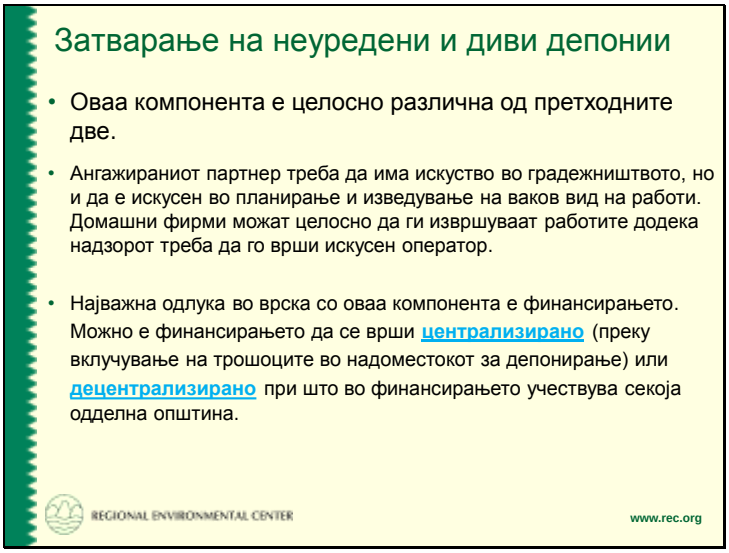
Затварање на неуредени и диви депонии
• Оваа компонента е целосно различна од претходните две.
• Ангажираниот партнер треба да има искуство во градежништвото, но и да е искусен во планирање и изведување на ваков вид на работи. Домашни фирми можат целосно да ги извршуваат работите додека надзорот треба да го врши искусен оператор.
• Најважна одлука во врска со оваа компонента е финансирањето. Можно е финансирањето да се врши централизирано (преку вклучување на трошоците во надоместокот за депонирање) или децентрализирано при што во финансирањето учествува секоја одделна општина.
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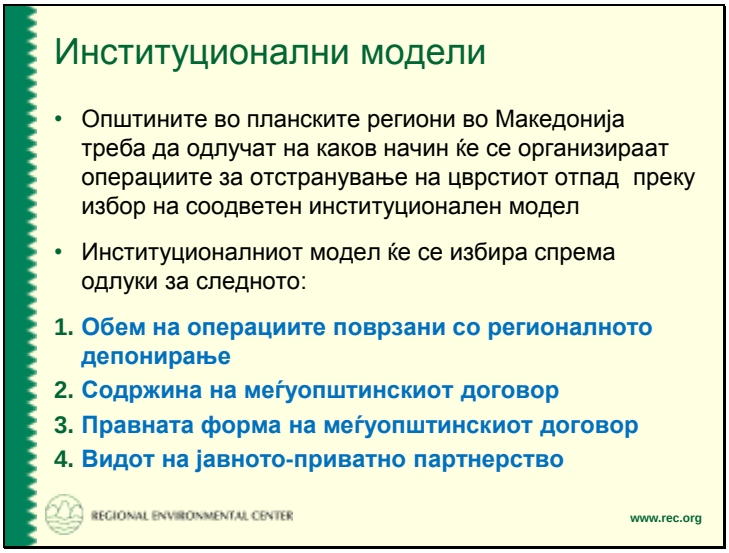
A. Petrovska: Legal forms and content of Inter-municipal Agreement

Slide 1

Slide 2



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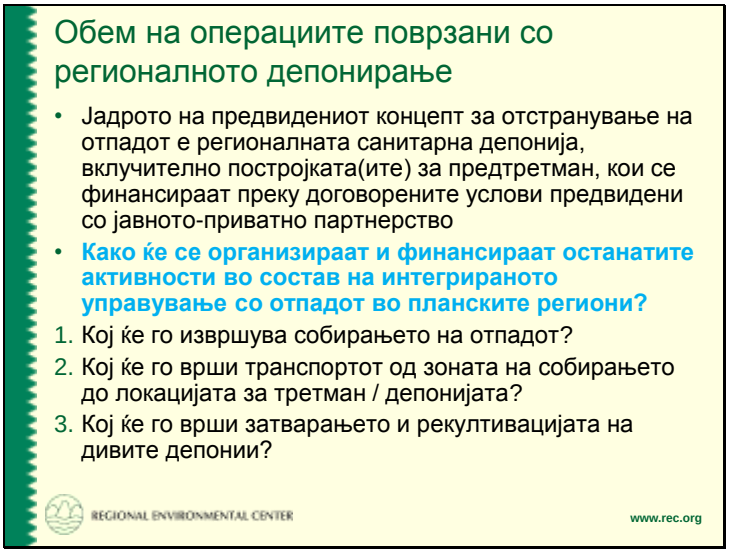

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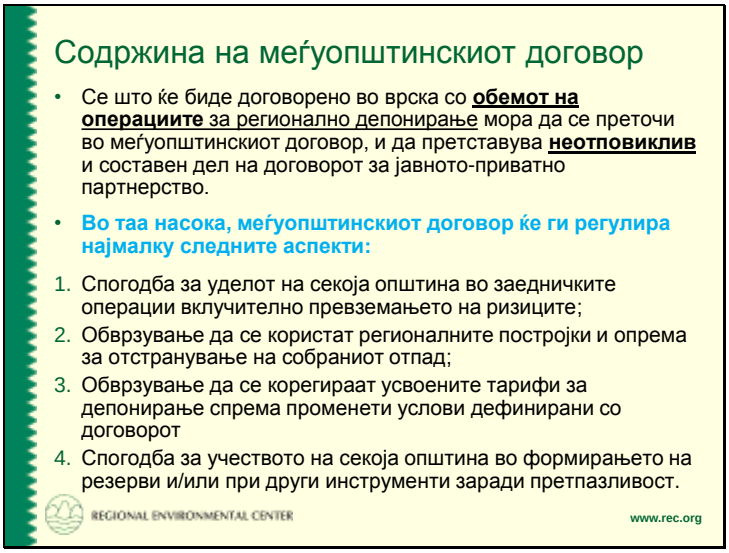

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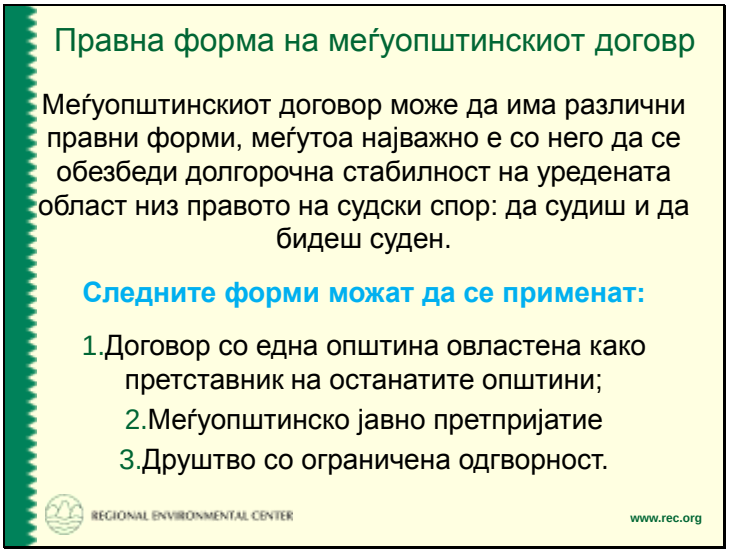

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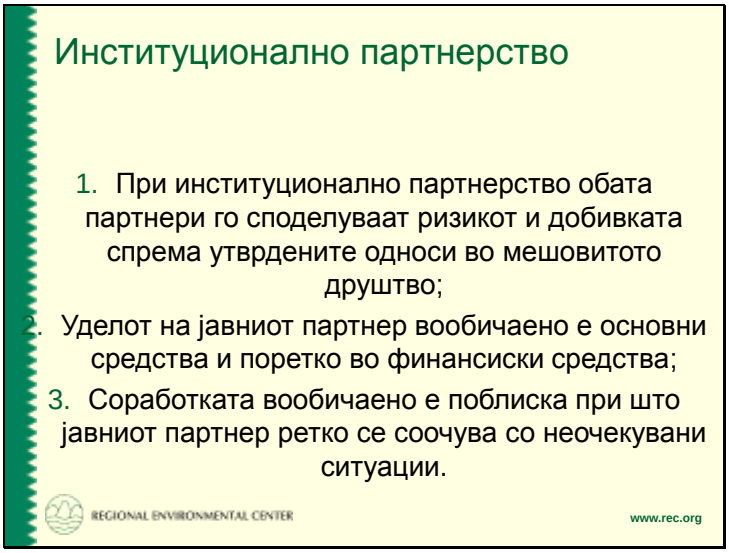

K. Radovanović: Overview of Macedonian waste legislation in the light of EU legislation and targets for waste

Slide 1

Ефикасна децентрализација на законодавството за животна средина

Регионален центар за заштита на животната средина за Централна и Источна Европа

Охрид
21-22 септември, 2010

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Slide 2

ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

СТРУКТУРА НА ЗАКОНОДАВСТВОТО ЗА УПРАВУВАЊЕ СО ОТПАД

Закон за управување со отпад - рамковен закон

Подзаконски акти:

- **Специфичности кои се однесуваат на елементите за постапување со отпад -собирање (вклучувајќи и селективно собирање), транспортирање, складирање, третман, преработка и отстранување (со посебен акцент на депонирањето и горењето/согорувањето, поради масовноста на практикување и деликатноста на постапките по однос на животната средина и здравјето на лугето), и**
- **специфичностите на поедините текови отпад - комунален отпад, инертен отпад (каде најзастепен е отпадот од градежништвото), отпад од пакување, отпадни батерии и акумулатори, отпадни масла, отпаден азбест и т.н.**

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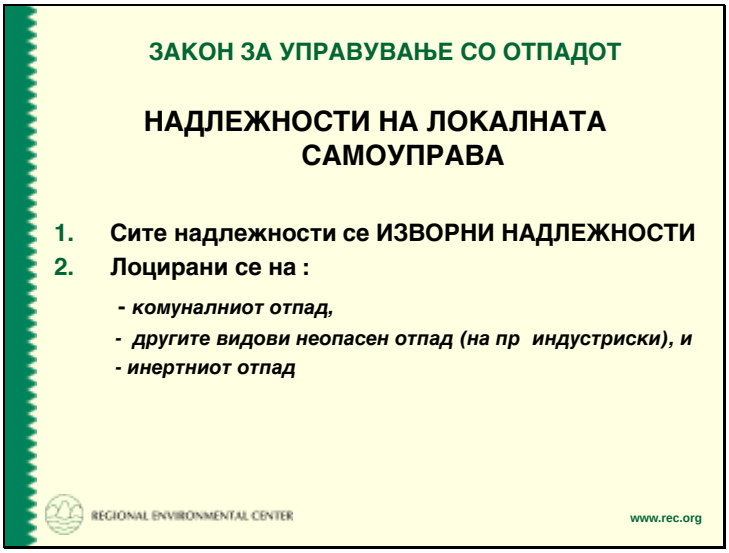
Slide 3



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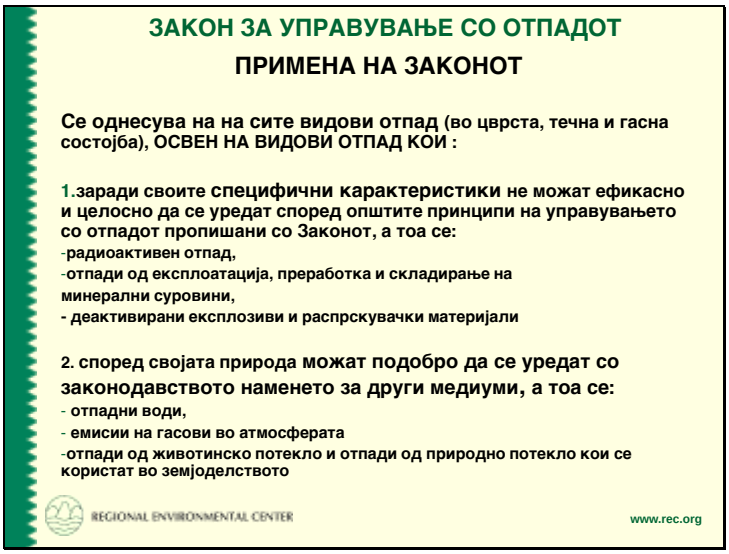

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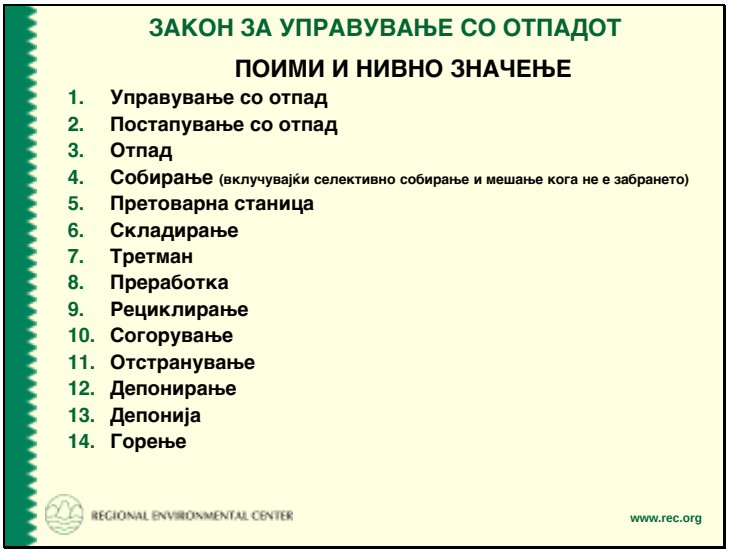

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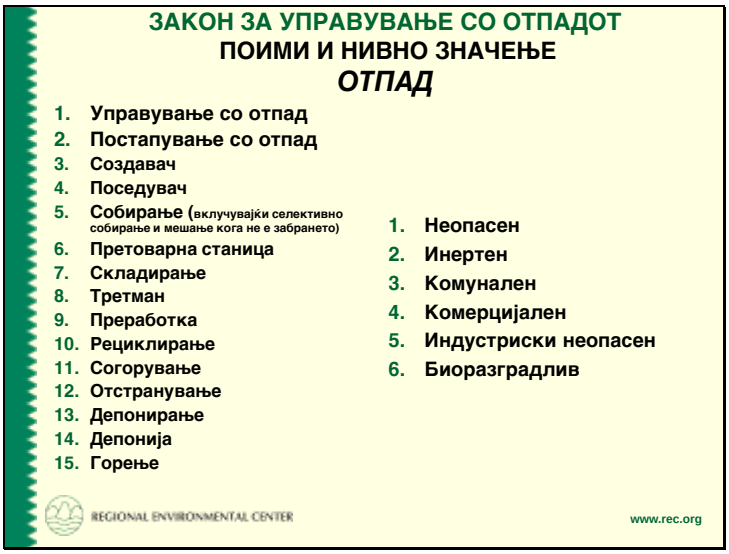

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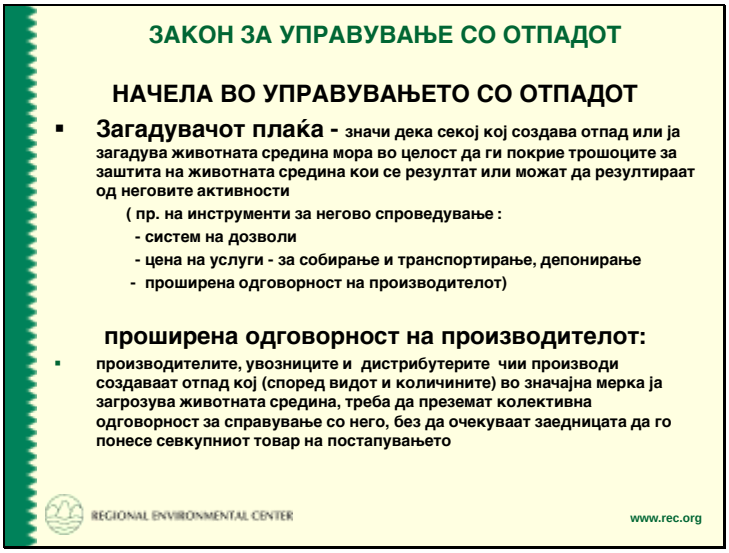

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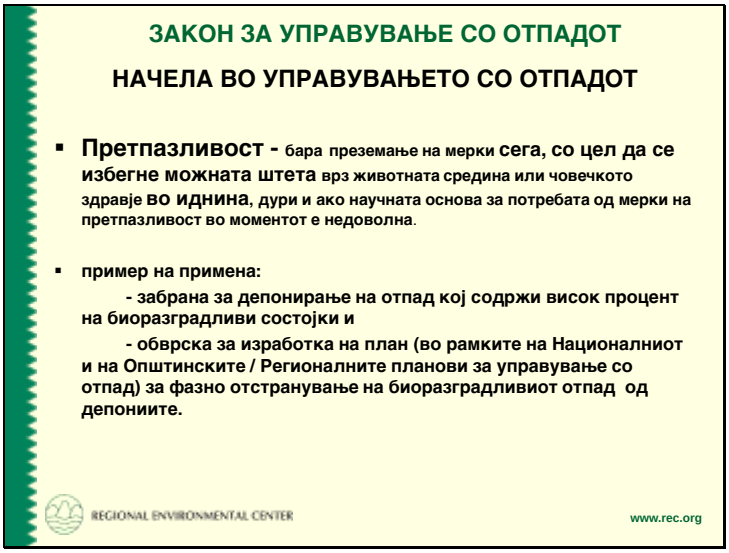

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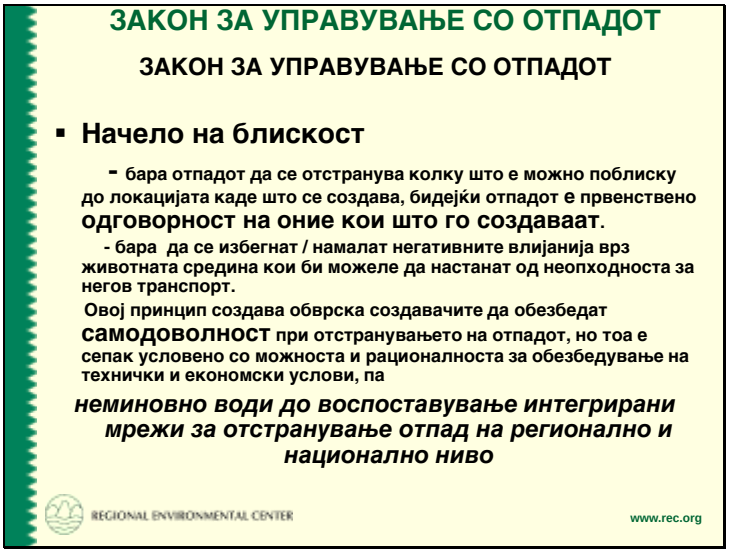

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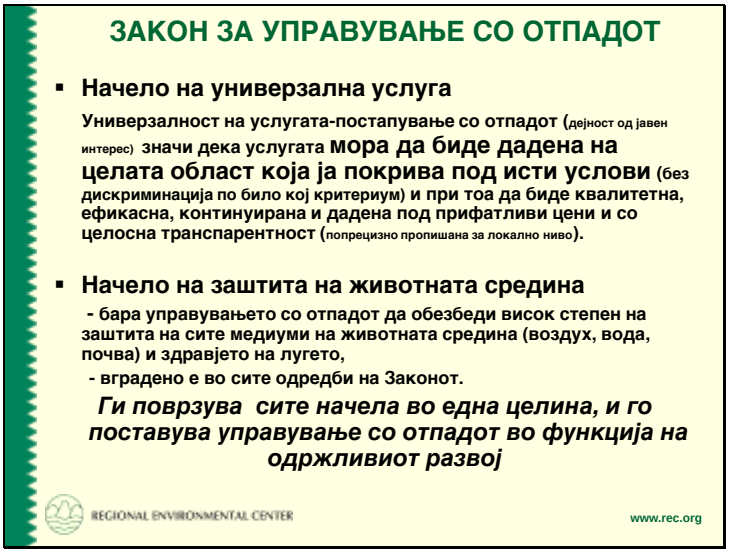

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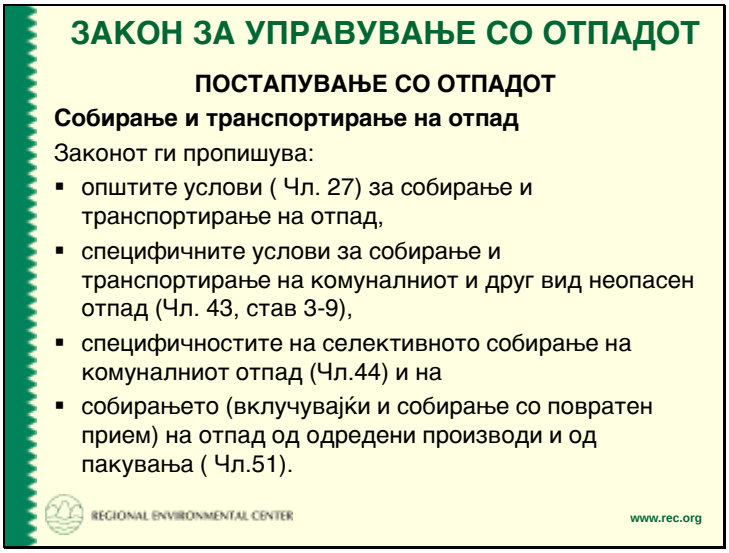

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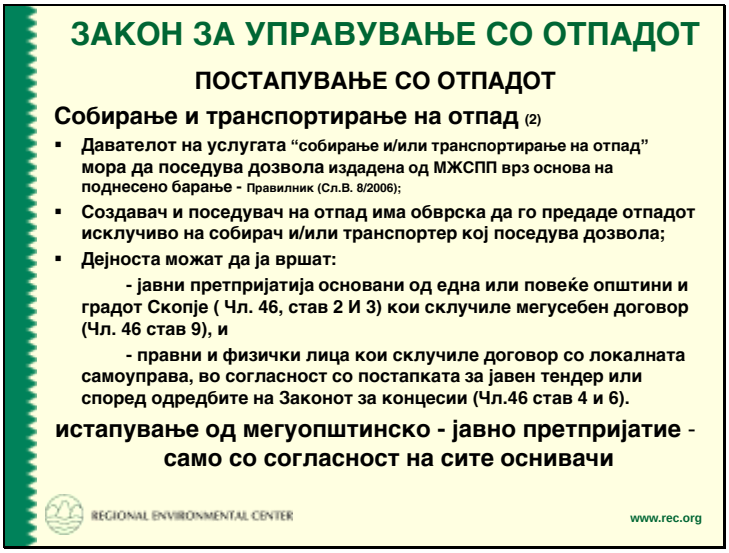

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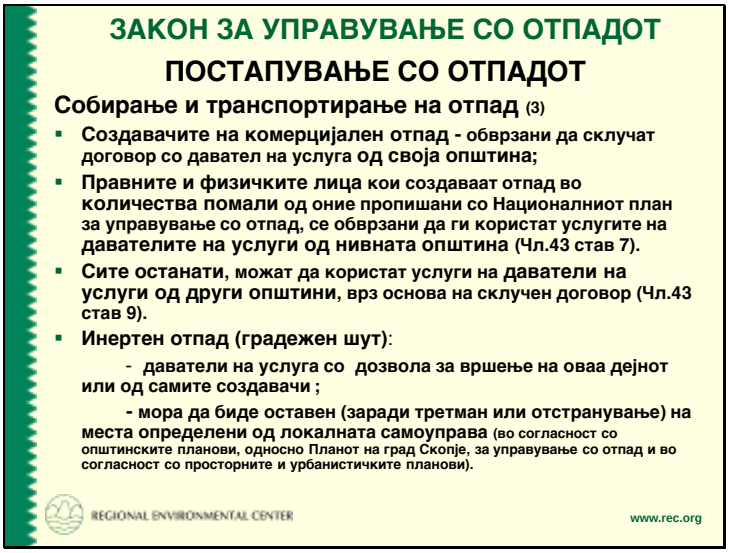

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ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

Собирање и транспортирање на отпад (4)

Обврски на учесниците во процесот на собирање и селекција на комунален отпад

Учесници	Обврска
Minister za zivotna sredina i prostorno planirawe	Ги утврдува: - условите кои треба да ги исполнат местата каде се врши собирање и селекција на комуналниот отпад, - начинот на одбележување и минималните технички услови за садовите и другата опрема за собирање на отпадот
Градоначалник	- ги определува местата каде се врши собирање и селекција на комуналниот отпад во согласност со начелото на блискост - се грижи дали давателот на услугата во целост ја исполнува доверената задача - обезбедува дека граѓаните се целосно информирани за: - донесените акти со кои се обезбедува универзалност на услугата - начинот на определување на надоместокот на услугата, - видовите на казнени и стимулативни мерки
Давател на услуги	ги поставува садовите и ја обезбедува другата опрема за собирање на отпадот
Создавач	го селектира отпадот и го остава на определените места

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ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

ПОСТАПУВАЊЕ СО ОТПАДОТ (1)

Складирање на отпад

Може да биде организирано:
- во рамките на инсталацијата која создава отпад,
- во рамките на инсталациите за третм./преработка/отстранување
- како индивидуална дејност,

Во сите случаи е ограничено на ;
- три години доколку складираниот отпад е наменет за третман/преработка или
- на една година доколку е наменет за отстранување.

Правните и физичките лица мора **да поседуваат дозвола.**

МЖСПП пропишува: форма и содржина на барање и дозвола, мин. техн. услови на локацијата и за дејноста;

Градоначалници одредуваат локации.

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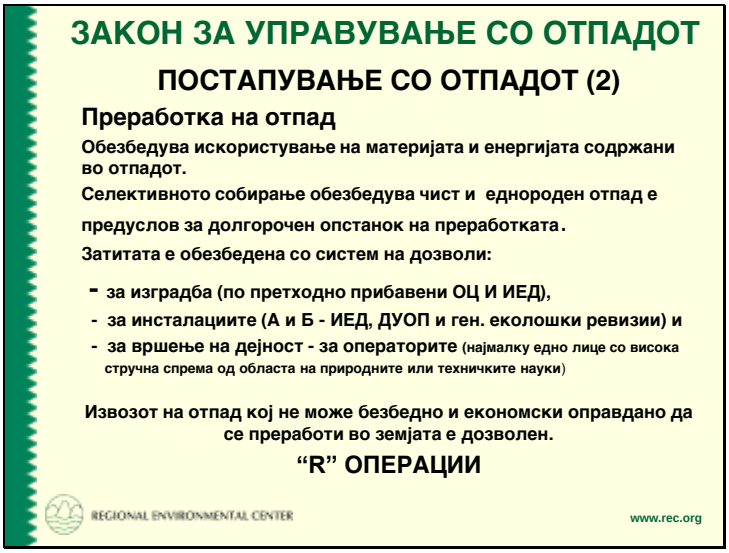

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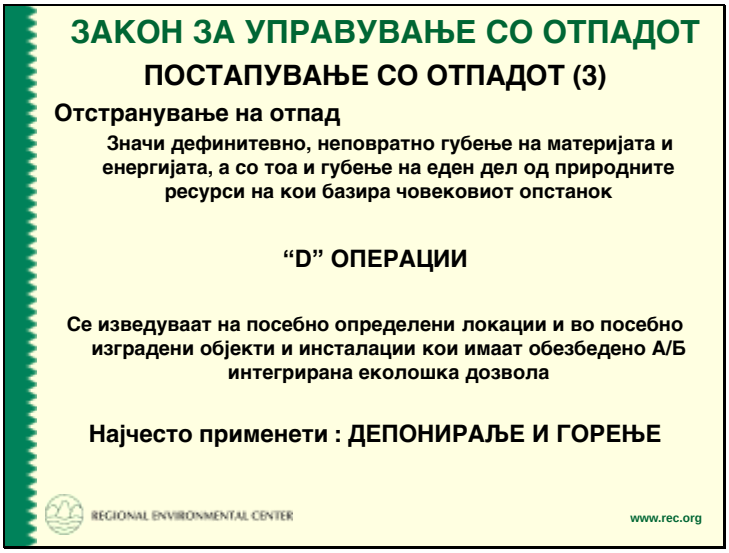

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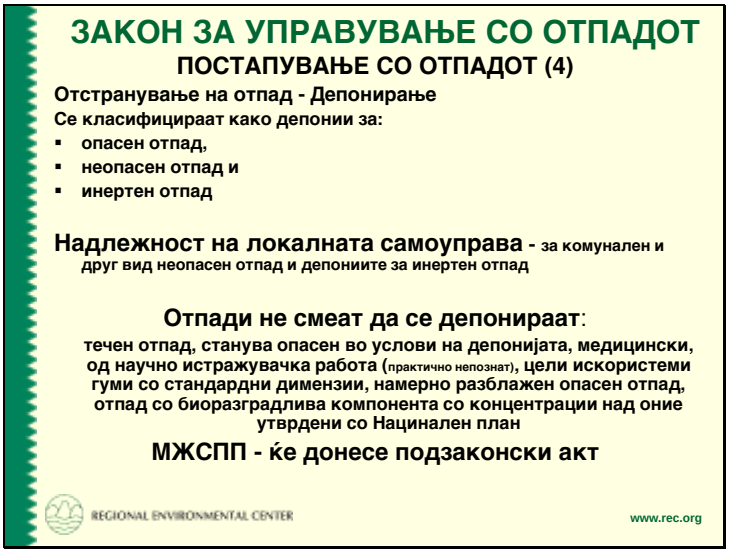

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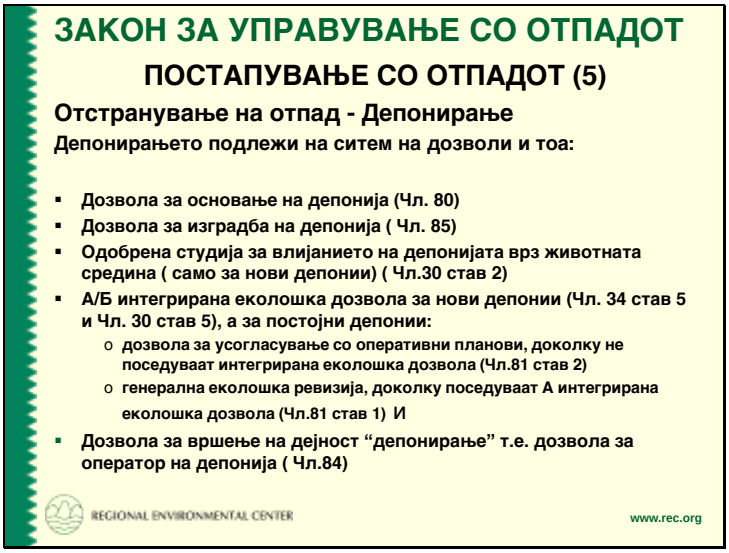

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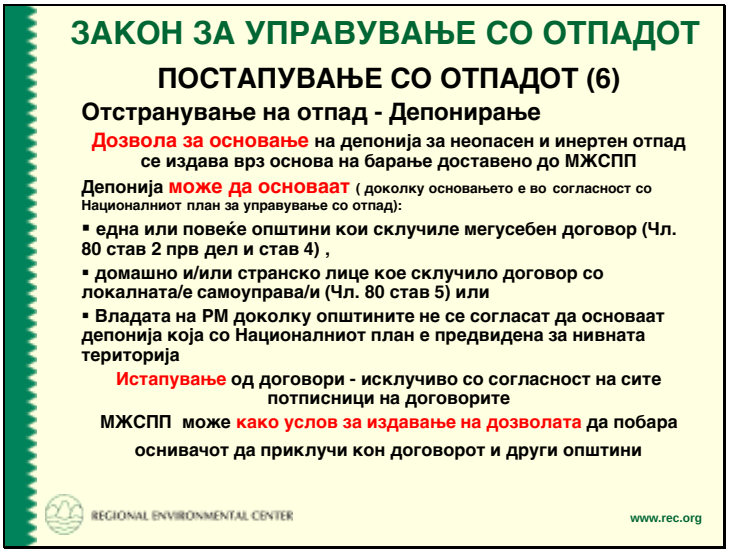

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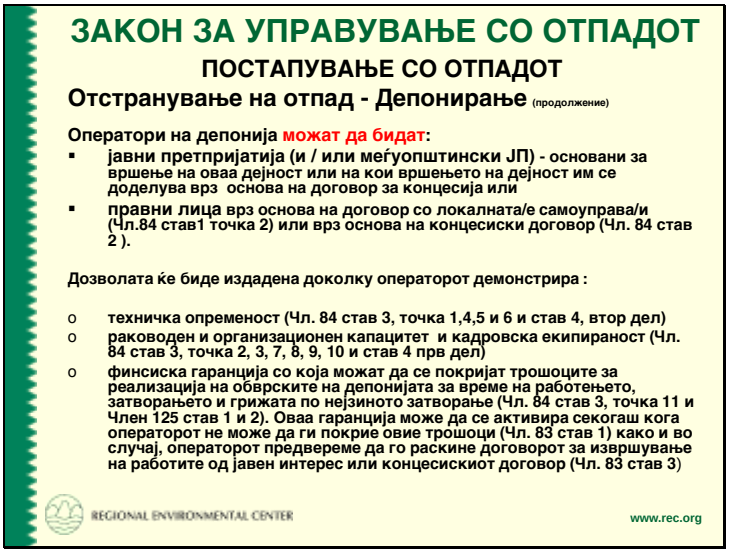

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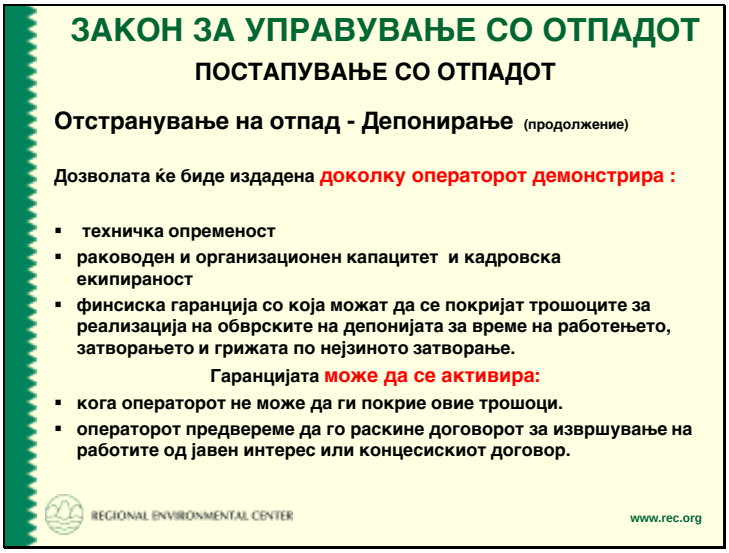

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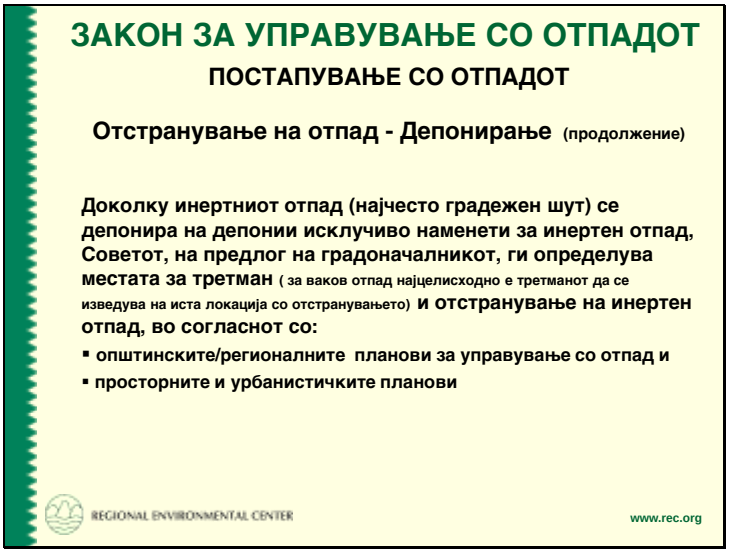

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ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

ПОСТАПУВАЊЕ СО ОТПАДОТ

Отстранување на отпад - Горење

Горењето не се практикува често за отстранување на комунален и друг вид неопасен отпад, воглавно заради:

- **виските трошоци кои произлегуваат од високите стандарди за инсталациите за горење и постапките кои се применуваат, а кои се идентични за сите видови отпад (комунален, опасен, медицински и т.н.),**
- **капацитетот на инсталацијата за горење е ограничувачки фактор за помали заедници - создавачи на отпад**

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ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

Интегрирано управување со цврст отпад на регионално ниво

- Собирање на комунален и друг неопасен отпад, стандардизација и економичност на услугата
  - Садови за собирање (60 / 120л, 1,1 м^3, 5 - 7 - 9 м^3)
  - Возила за собирање (подигачи на контејнери, рото прес, со потисна плоча, возила за тешки терени, возила за тесни улици)
  - Планирање на селективно собирање
  - Комбинација на рути за возила со мала и голема зафатнина
  - Оптимизација на работни смени
  - Оптимизација на транспорт од зона на собирање до локација за третман / отстранување
  - Оптимален број на вработени по тон собран отпад (тековна состојба од 5 - 20 / собран тон отпад)
  - Пресметките за тековни трошоци за собирање се движат од 20 - 130 €/тон

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ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

Интегрирано управување со цврст отпад на регионално ниво

- Регионален транспорт
  - Трансфер станици (ТС) се инсталираат доколку трошоците за директен транспорт до депонија се повисоки од трошоците за претовар и тоа:
    - Не е рационална инсталација на ТС за годишен капацитет еднаков или помал од 2,500 тони
    - За годишен капацитет од и над 10,000 тони и растојание околу 140 км. до депонија се исплати изградба на трансфер станица
    - За капацитети над 20,000 тони годишно, изградбата се исплаќа за растојанија од околу 60 км.
    - За изградба на едноставни трансфер точки (инвестиција од најмногу 50,000 €), рационални се годишни капацитети од 10,000 тони за растојанија од 120 км, или 5,000 тони за растојание од м140 км.)

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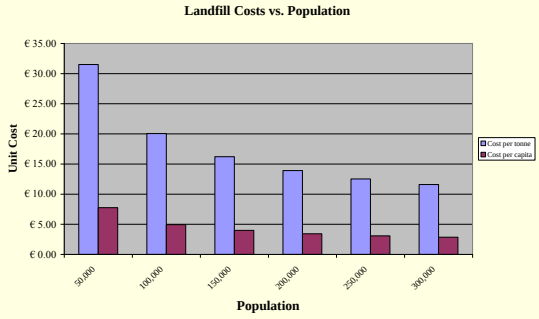
ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

Однос помеѓу цената на депонирање и големина на регион



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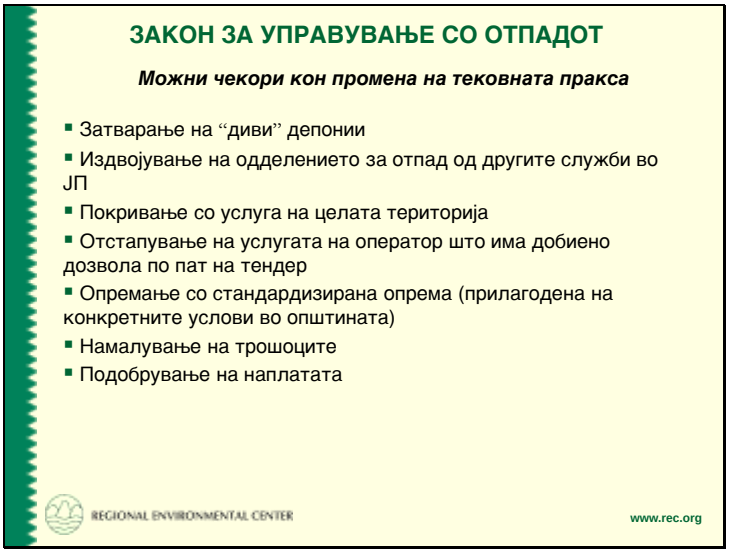

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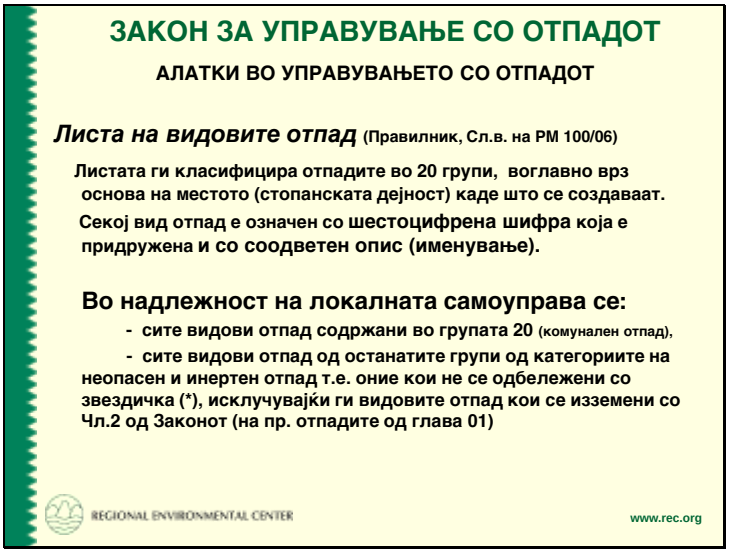

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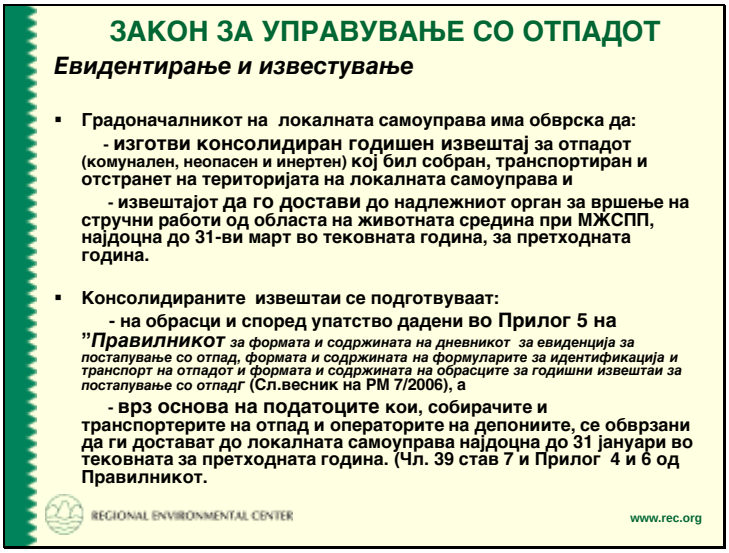

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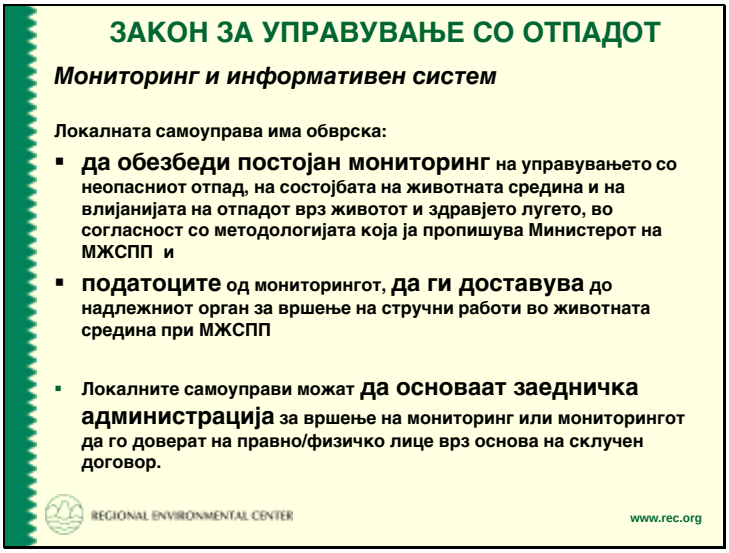

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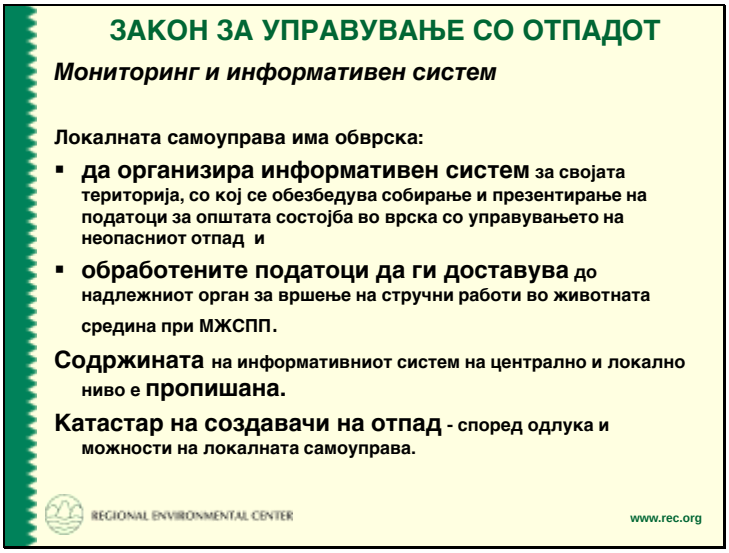

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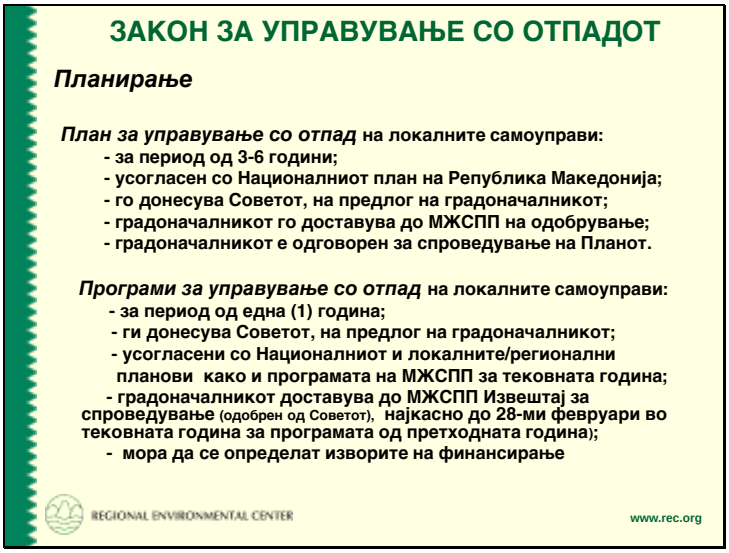

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ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

***Планирање** (2)*

Обврски *на правните и физичките лица*, во процесот на планирање, кон локалната самоуправа:

- ги доставуваат своите програми за наредниот период (наредните 3 години), најдоцна во септември во тековната година;

- поднесуваат годишен Извештај за спроведување најдоцна до 31-ви јануари во тековната година, за програмата од претходната година.

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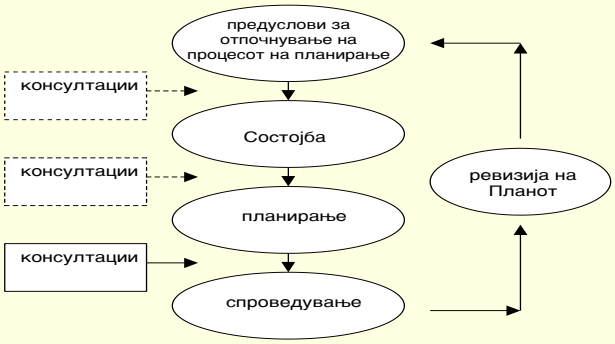
ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

***Планирање** (3)*



ПРОЦЕС НА ПЛАНИРАЊЕ

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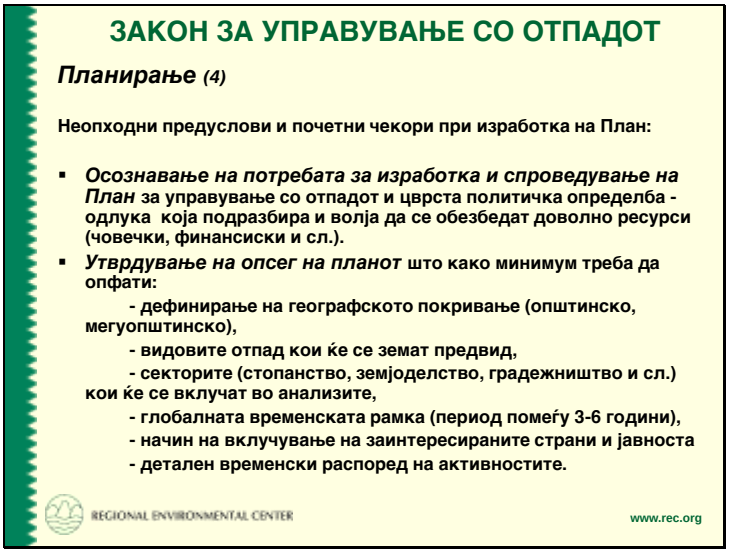

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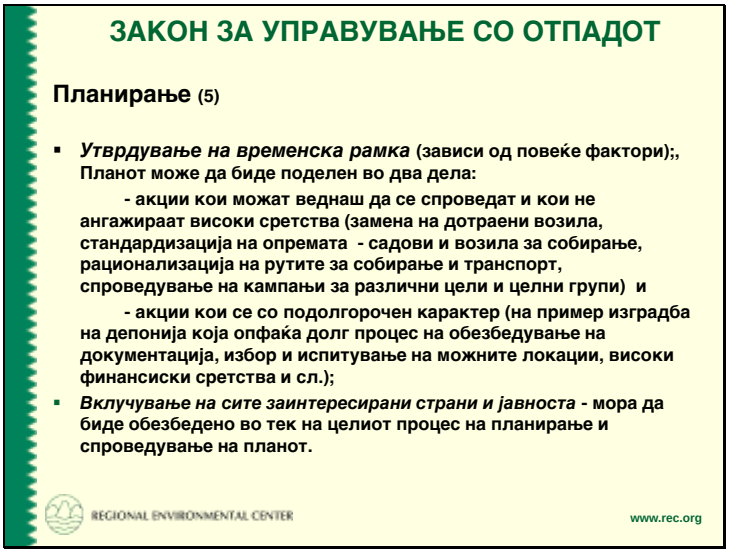

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ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

Планирање (6)

- ***Детален временски распоред (шема) на изведба на планирани активности*** **со која се овозможува успешно следење на спроведувањето на планот и олеснува изготвувањето на годишните Програми,**
- ***Усогласување со веќе усвоените Планови на национално/регионално и локално ниво*** **(Националниот план за управување со отпад, НЕАП, ЛЕАП-ите, Просторните планови, плановите во сферата на енергетиката, транспортот, здравствениот сектор и др.) - можат да имаат импликации врз локалните Планови за управување со отпад**

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ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ

Шема на планирани акции (НПУО 2006-2012)

	Акција	Носители	Главен опфат
C	Технички/оперативни мерки		
C 1	Регионални постројки за управување со ЦО		
C.1.1	Зголемен опфат на собирање во општините	општини,	Финансирање и организација на собирање на отпадот во руралните средини.
C.1.2	Затворање/рекултивација на нелегални депонии	општини	Финансирање, тендер и реализација на затворањето/ремедијацијата
C.1.3	Затворање/рекултивација на општинските депонии	МЖСПП, општини, МФ, МОЈП	Финансирање, тендер и реализација на затворањето/ремедијацијата
C.1.4	Постројки и опрема за интегрирано УЦО во регионите	МЖСПП, општини, МФ, МОЈП	Финансирање, тендер, набавка на регионални постројки и опрема; враќање на трошоците

Акција	2007	2008	2009	2010	2011	2012
Зголемен опфат на собирање во општините						
Затворање/рекултивација на нелегални депонии						
Затворање/рекултивација на општинските депонии						
Постројки и опрема за интегрирано УЦО во регионите						

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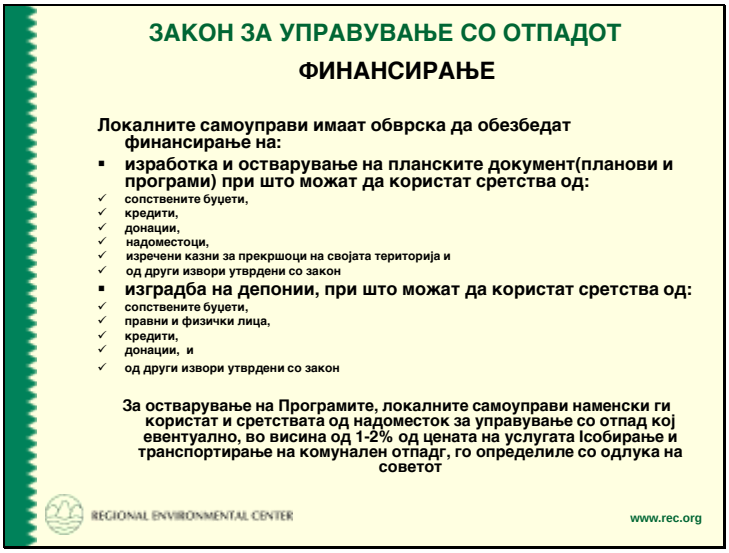

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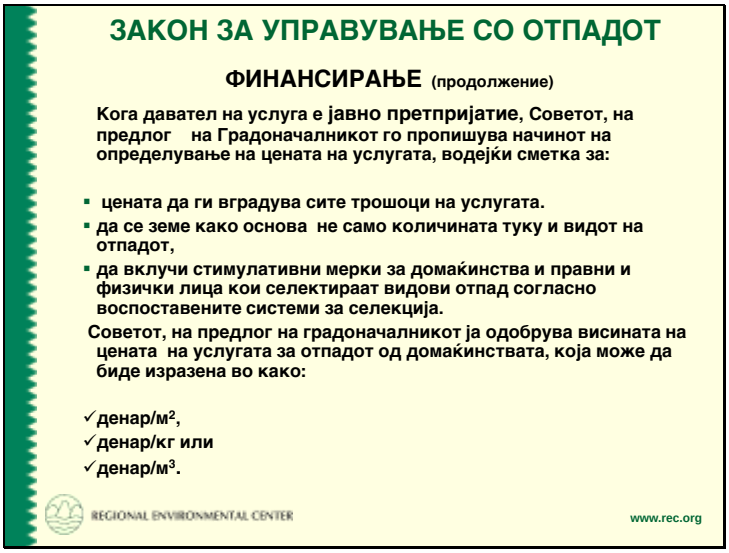

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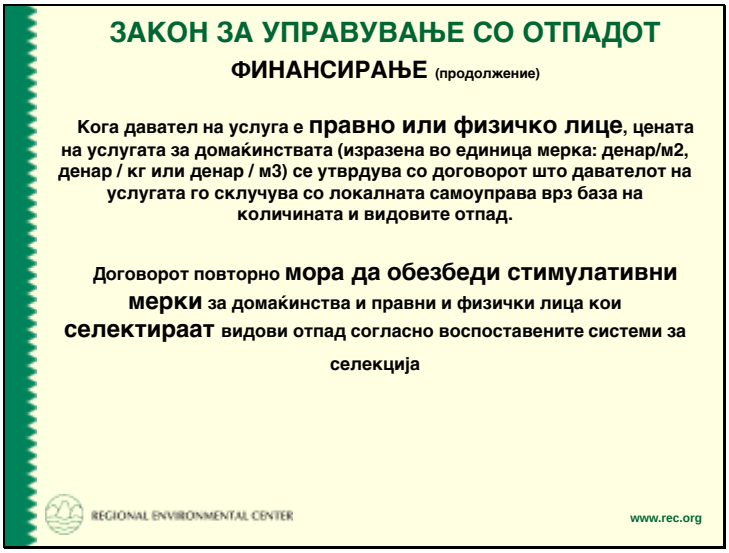

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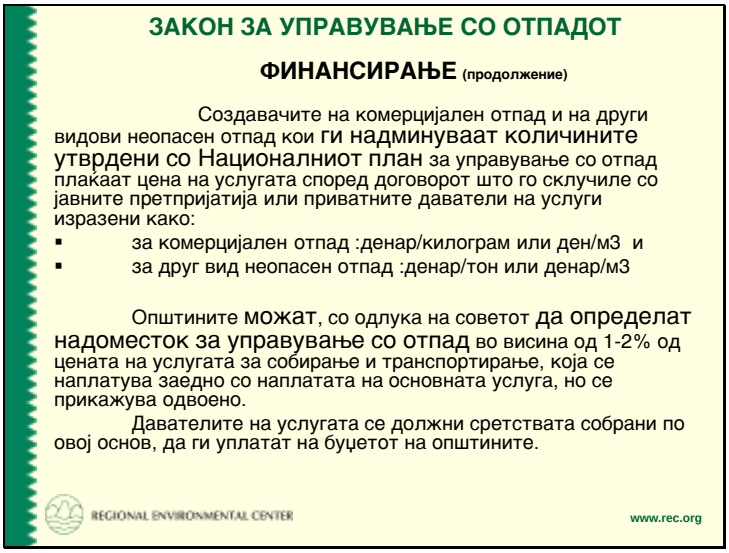

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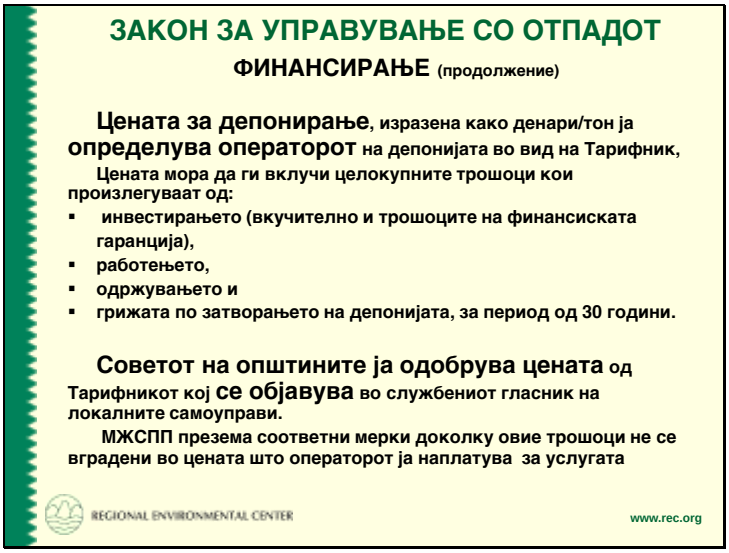

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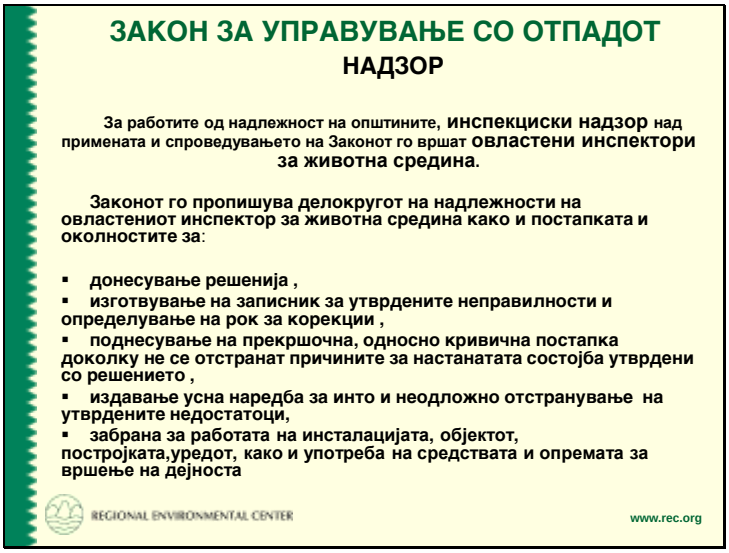

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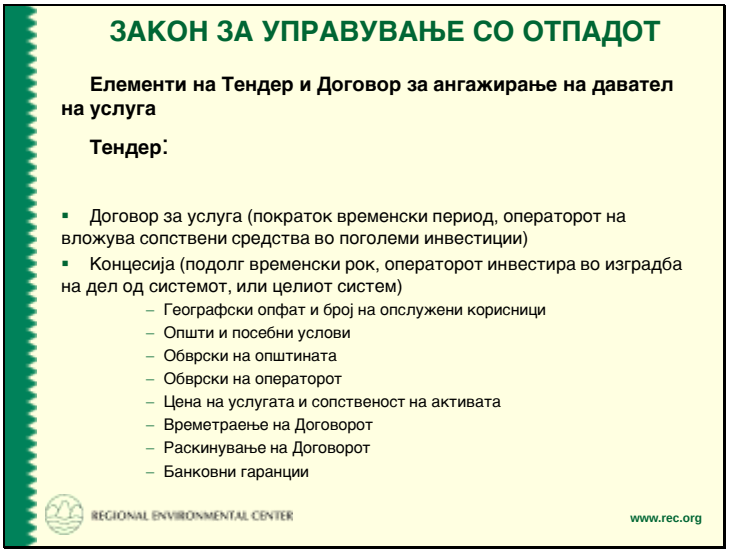
ЗАКОН ЗА УПРАВУВАЊЕ СО ОТПАДОТ
Елементи на Тендер и Договор за ангажирање на давател на услуга
Тендер:
▪ Договор за услуга (пократок временски период, операторот на вложува сопствени средства во поголеми инвестиции)
▪ Концесија (подолг временски рок, операторот инвестира во изградба на дел од системот, или целиот систем)
– Географски опфат и број на опслужени корисници
– Општи и посебни услови
– Обврски на општината
– Обврски на операторот
– Цена на услугата и сопственост на активата
– Времетраење на Договорот
– Раскинување на Договорот
– Банковни гаранции
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A Petrovska: Alternative technologies for waste disposal

Slide 1

Технологии за третман / преработка на отпад (искуства од Европа)

Охрид
21-22 септември, 2010

Slide 2

Содржина

1. Вовед
2. Што претставува МБТ
3. Примери од воспоставување на вакви техологии во земјите на ЕУ
4. Заклучоци

Slide 3

Вовед – Постигнување на целите во управувањето со отпад

Пр. Германија:
Технички насоки за постапување со комунален отпад со воведување на забрана за отстранување на биоразградливата фракција од 1-ви јуни 2005 год.
- Швајцарија: Забрана за отстранување на запаллив отпад уште од 2000 год.
- Норвешка: Забрана за отстранување на биоразградлив отпад од 2001год.
- Австрија: Забрана за отстранување на нетретиран отпад уште од 2004 год.

Европа:
Цел за 2020 год.: *Целосна преработка на ЦКО до крајот на 2020 год.*

ЕУ Директива за депонии (99/31/ЕС)
- Постапно намалување на количините на биоразградлив отпад што е наменет за депонирање
(цел: до 65 % до крајот на 2016 – во однос на значењето за климатските промени - 3.5 мил. тони CH_4)

Slide 4

Вовед - Можности

Селективно собирање и искористување на отпадот

Одвојување на ресиклабилните фракции и нивно повторно враќање во цикличниот тек на материјали

Механички-биолошки третман

(меѓу другите има и значително учество на биоразградлива компонента, подложна на компостирање)

Согорување на отпад

Минерализација/ Инертизација на органската фракција при оксидација на висока температура

Slide 5

Цели на МБТ

1. **Намалување на отпадот што се депонира**
   за намалување на потребниот капацитет за депонија и да се продолжи оперативниот век на депоијата.
2. **Намалување на микробиолошката активност**
   на биоразградливата фракција со цел минимизирање на неконтролираното создавање на депонискиот гас и спречување на ефектот на стаклена градина.
3. **Редукција на маса на опасни супстанции**
   кои инаку би се појавиле во исцедокот од депонијата и претставуваат потенцијална опасност за загадување на подземните води доколку исцедокот не се собира и третира.
4. **Преработка на материјали и енергија**
   по пат на одвојување на материјали и таму кадешто е применливо се генерира гориво добиено од преработка на отпад – refused derived fuel (RDF) или биогас (постројки за МБТ со анаеробна дигестија)

Slide 6

МБТ – Правна рамка

- Строги барања во врска со тековите на отпад што се наменети за депонирање (тешко да се постигнат)
- Строги барања за гасовите што се емитираат во атмосферата (за пречистување на излезните гасови потребни се Регенеративни топлински оксидативни системи)
- Не постојат правни барања во врска со фракциите кои имаат висока калориска вредност (RDF)

Slide 7

МБТ – Барања за квалитет на RDF

Potential consumer		Calorific value	Granulometric properties	Content of chlorine
Waste incineration		6-12 MJ/kg	no special requirements	no special requirements
WtE-plants	Grate combustion	11-17 MJ/kg	< 300 mm	< 2 %
	Fluidized bed combustion		< 100 mm	
	Pyrolysis		< 300 mm	
Industrial co-incineration	pit coal (dust feeding)	> 14 MJ/kg	< 20 mm	< 1 %
	brown coal (dust feeding)	> 11 MJ/kg	< 25 mm	
	brown coal (fluidized bed combustion)	> 11 MJ/kg	< 50 mm	
Cement kiln	Primary firing system	> 20 MJ/kg	< 30 mm	< 1 %
	Calciner firing system	14-18 MJ/kg	< 35 mm	
	Fluidized bed combustion	> 11 MJ/kg	< 50 mm	

Slide 8

МБТ– Принципи на процесот

Пристап насочен кон проток на материјали

Селективно одвојување на мешаниот отпад:

- *отпад за преработка на материјали*
- *отпад за преработка на енергија*
- *отпад за биолошки третман*

2 основни процеси

Стабилизација и сушење на отпадот што е наменет за преработка заради добивање на енергија

Третман на отпад со цел намалување на емисиите кои потекнуваат од депонирањето

Slide 9

МБТ - Проблеми

- Амбициозните стандарди за животна средина во некои од земјите на ЕУ прават технологијата на МБТ, да биде скапа и во никој случај поефтина од инсинерацијата.
- Согласно наметнатите прилики, МБТ претставува технологија за предтретман што и претходи на постапката за термички третман, но не претставува алтернатива за инсенерацијата.
- Техничките проблеми поврзани со отпочнување на технолошкиот процес се надминати (освен проблемите со Регенеративните топлински оксидативни системи за третман на излезните гасови).
- Во моментот постојат пазарни проблеми со високо калориските фракции поради недостаток на капацитети (постројки) за топлинско искористување, како и поради квалитетот на ваквите фракции.

Slide 10

Заклучоци

- Намалување на
  - содржина на тешки метали од отпадот до 90 %,
  - реактивноста на органската фракција до 95 % и
  - волуменот на отпад за повеќе од 60 %
- Резултатите се намалување на емисиите и унапредување на начините за отстранување на резидуите.
- Зголемување на искористувањето на материјалите за повторна употреба, како и искористување на енергетскиот потенцијал на отпадот.
- Правната рамка мора да биде прилагодена на ефикасноста на МБТ технологијата!
- МБТ мора да биде составен дел на концептите кои работат согласно материјалниот проток!
- Високо калориската фракција мора да се преработи во RDF така што ќе ги задоволува специфичните барања за квалитет поставени од корисниците (цементари, енергетски постројки и др.)

Slide 11

Заклучоци– услови за искористување на RDF

Калориски вредности на резидуите од отпадот

	Share [%]	Calorific value MJ/kg
Metal packaging	0,9	0
Plastic (mixed)	18,8	32,9
Glass (mixed)	5,6	0
Paper and cardboard (mixed)	24,9	11,0
Biodegradable waste (mixed)	35,7	3,6
Garden an park waste	4,5	3,8
Incombustible waste	6,8	3,6
Other	2,8	5,8
Average		**10,8**

- Високата содржина на пластика и хартија/картон поттикнува споредливо високи калориски вредности
- Нејасна е содржината на опасните супстанции (пр. хлор)

Slide 12

Типови на согорување

- Инсенерација (искористување на енергијата преку целосна оксидација)
  - Горење на маса
  - Гориво добиено со третман на отпад - Refuse Derived Fuel (РДФ)
- Пиролиза
- Гасификација
- Метод на плазма (напредна топлинска конверзија)

Slide 13

Инсенерација на отпад - Предности

- Намалување на волумен и тежина (приближно 90% волуменска и 75% тежинска редукција)
- Инстантно намалувањето на отпадот
- Се постигнува уништување на отпадот за неколку секунди, наспроти 100-те години за распаѓање на некои од компонентите отстранети на депонија
- Инсенерацијата може да се одвива на самото место на создавање на отпад
- Емисиите во воздух можат да се контролираат
- Остатоците од пепел често се инертни, крајно минерализирани
- Се бара мала површина за нивно отстранување
- Трошоците може да се покријат, така што ќе се обезбеди искористување на топлината / продажба на ел. енергија

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Аспекти во врска со заштитата на животната средина

- Тон отпад генерира 3.5 MW енергија (што ја произведуваат 300 kg мазут), обезбедувајќи енергија за 70 домови
- Biogenic portion of waste is considered CO_2 neutral (дрвото користи повеќе CO_2 за време на својот животен век отколку што ослободува при согорувањето)
- Не смее да го замени рециклирањето

Slide 15

Инсенерација на отпад - Недостатоци

- Високи капитални трошоци
- Потреба од обучени оператори (главно за операциите поврзани со котелот)
- Некои материи се несогорливи
- Некои материи бараат воведување на дополнително гориво
- Можност за отфрлање од јавноста
  - Инценерацијата ќе ја намали вредноста на околното земјиште
  - Недоверба во способноста на Владата/индустријата да го регулира процесот

Annex 3: Workshop Participant lists

List of participants on the Workshop “Establishing Regional Waste Management system in Polog Region and South-East Region in Republic of Macedonia" for the members of the Commission for the implementation of the concession procedure in the municipalities of the South-East and Polog planning region, Strumica, hotel Sirius, 13 - 14 May 2010

Names with (*) indicate participants from the Polog Region

No.	Name	Position	Institution
1	Shefije Saiti*	Municipal Secretary	Municipality of Zhelino
2	Violeta Ismaili*	Junior adviser	Municipality of Zhelino
3	Nikola Gjorgiev	Secretary Podracna Edinica Ograzden Bosilovo	Municipality of Bosilovo
4	Toni Grazdanliev	Director Podracna Edinica Ograzden Bosilovo	Municipality of Bosilovo
5	Ljupco Kolev	Mayor	Municipality of Bosilovo
6	Liridona Beqiri	Associate	Ministry of Economy
7	Enver Pajaziti*	Mayor	Municipality of Brvenica
8	Servet Demiri	Associate	Ministry of Local Self-government
9	Saladin Ze]iri*	Environmental Inspector	Municipality of Tearce
10	Kabir Asani*	Head of finance	Municipality Mavrovo i Rostuse
11	Darko Spasovski*	Secretary	Municipality of Jegunovce
12	Vojislav Antovski*	Local Economic Developer	Municipality of Jegunovce
13	Zoran Gjorgiev	Head of urbanism	Municipality of Konce
14	Olivera Doldurova	Head of sector	Municipality of Radovis
15	Kaja Sukova	Head of sector	Ministry of Environment and Physical Planning
16	Saso Sekulovski	Head	Ministry of Environment and Physical Planning
17	Branko Georgiev	Local Economic Developer	Municipality of Dojran

No.	Name	Position	Institution
18	Goran Gavrilovski	Director	JPKD Komunalec Gevgelija
19	Mensur Zenuni*	Head of legal sector	Municipality of Vrapciste
20	Bajram Kadrija*	Mayor	Municipality of Vrapciste
21	Lirim Abdili*	Advisor	Municipality of Bogovinje
22	Hazbi Idrizi*	Mayor	Municipality of Bogovinje
23	Irfan Odai*	Local Economic Developer	Municipality of Tetovo
24	Gjorge Stojcev	Head of communal sector	Municipality of Valandovo
25	Fatos Baliu		Ministry of Environment and Physical Planning
26	Lence Kurcieva		Ministry of Environment and Physical Planning
27	Stojan Lazarev	Mayor	Municipality of Konce
28	Armands Nikolajevs	Director	LASUA
29	Ingrida Bremere	Project Manager	BEF Latvia
30	Kristina Veidemane	Waste expert	BEF Latvia
31	Aivars Sirmais	Director ZAAO	SIA ZAAO
32	Janis Abeltins	Director Geo Konsultants	LTD Geo-Konsultants
33	Mark Lindert	Waste Management planning	City of Düsseldorf
34	Katarina Stojkovska	Director	REC CO Macedonia
35	Ana Petrovska	Project Manager	REC CO Macedonia
36	Kornelija Radovanovic	Project Manager	REC CO Macedonia
37	Milena Manova	Project Assistant	REC CO Macedonia
38	Marina Ordzanova	Office Assistant	REC CO Macedonia

List of participants of the National Workshop for the members of the Commission for the implementation of the concession procedure in the municipalities of the South-East and Polog planning region, Ohrid, Hotel Belvedere 21-22 September, 2010

No.	Name	Position	Institution
1	Nikola Gjorgiev	Secretary Podracna Edinica Ograzden Bosilovo	Municipality of Bosilovo
2	Toni Grazdanliev	Director Podracna Edinica Ograzden Bosilovo	Municipality of Bosilovo
3	Ljupco Kolev	Mayor	Municipality of Bosilovo
4	Liridona Beqiri	Associate	Ministry of Economy
5	Enver Pajaziti	Mayor	Municipality of Brvenica
6	Saladin Ze]iri	Environmental Inspector	Municipality of Tearce
7	Kabir Asani	Head of finance	Municipality Mavrovo i Rostuse
8	Darko Spasovski	Secretary	Municipality of Jegunovce
9	Vojislav Antovski	Local Economic Developer	Municipality of Jegunovce
10	Zoran Gjorgiev	Head of urbanism	Municipality of Konce
11	Olivera Doldurova	Head of sector	Municipality of Radovis
12	Kaja Sukova	Head of sector	Ministry of Environment and Physical Planning
13	Saso Sekulovski	Head	Ministry of Environment and Physical Planning
14	Branko Georgiev	Local Economic Developer	Municipality of Dojran
15	Goran Gavrilovski	Director	JPKD Komunalec Gevgelija
16	Mensur Zenuni	Head of legal sector	Municipality of Vrapciste
17	Bajram Kadrija	Mayor	Municipality of Vrapciste
18	Lirim Abdili	Advisor	Municipality of Bogovinje
19	Hazbi Idrizi	Mayor	Municipality of Bogovinje
20	Irfan Odai	Local Economic Developer	Municipality of Tetovo
21	Gjorge Stojcev	Head of communal sector	Municipality of Valandovo
22	Fatos Baliu		Ministry of Environment and Physical Planning
23	Stojan Lazarev	Mayor	Municipality of Konce
24	Katarina Stojkovska	Director	REC CO Macedonia
25	Ana Petrovska	Project Manager	REC CO Macedonia

No.	Name	Position	Institution
26	Kornelija Radovanovic	Project Manager	REC CO Macedonia
27	Milena Manova	Project Assistant	REC CO Macedonia
28	Marina Ordzanova	Office Assistant	REC CO Macedonia
29	Danco Uzunov	Expert	PointPro
30	Miroslav Trajanovski	Expert	PointPro
31	Rufi Osmani	Mayor	Municipality of Gostivar
32	Naxi Ismaili	Advisor	Municipality of Gostivar
33	Lirim Abdili	Communal Inspector	Municipality of Bogovinje
34	Bajram Kadrija	Communal Inspector	Municipality of Vrapciste
35	Fatmir Izairi	Environmental Inspector	Municipality of Zelino
36	Ha]im Ramadani	Advisor	Municipality of Brvenica

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Implementing organizations:

Baltic Environmental Forum
Germany
www.bef-de.org

Baltic Environmental Forum
Latvia
www.bef.lv

Regional Environmental
Center for Central and East-
ern Europe Country Office
Macedonia
www.rec.org.mk

waste
management

Baltic Environmental Forum
Deutschland e. V.
Osterstraße 58 | 20259 Hamburg | Germany

www.bef-de.org