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# USAID KOSOVO PRIVATE ENTERPRISE PROGRAM (KPEP)

## Kosovo Plastic Recycling Activity

**MDC-TI.NET**

Implemented by  
Booz Allen Hamilton

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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government

# KOSOVO PLASTIC RECYCLING ACTIVITY

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Kosovo Private Enterprise Program project “Kosovo plastic recycling activity”, Contract No. EEM-I-07-00007-00,  
TO #2

This report submitted to Booz Allen Hamilton / October, 2009

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**ACRONYMS:**

<b>KPEP</b>	USAID Kosovo Private Enterprise Program
<b>MDC TI Net.</b>	Macedonian Business Resource Center
<b>PRP</b>	Plastic Recycling Project Macedonia
<b>PETRA</b>	Plastic Recycling Association
<b>MESP</b>	Ministry of Environment and Spatial Planning
<b>EPA</b>	Environmental Protection Agency
<b>PET</b>	Polyethylene Terephthalate
<b>HDPE</b>	High Density Polyethylene
<b>LDPE</b>	Low Density Polyethylene

## PURPOSE OF ASSIGNMENT

In September 2009, the USAID Kosovo Private Enterprise Program designated the Macedonian Business Resource Center (MDC TI Net.) from Skopje to assess Kosovo Plastic Recycling Industry and recommend Plastic Recycling Activity based on experiences and lessons learned from the Macedonia Plastic Recycling Project. The overall goal of the assignment was MDC-Ti.Net to assess the Kosovo Plastic Recycling Industry and detect areas of support in order KPEP to launch an efficient and economically valuable plastic recycling activity in Kosovo.

For purposes of 'Kosovo Plastic Recycling Project', the MDC-Ti.Net conducted thorough investigation of plastic recycling sector in order to determine the potential for a countrywide recycling effort, and development of feasibility study.

The overall MDC-Ti.Net responsibilities included:

1. Conduct survey of companies and identify products and costumers
2. Design solution for collection of plastic waste
3. Conduct operative and financial feasibility study

The market survey titled "Survey of Plastic Processing Firms and their Recycling Activities and Experience" was undertaken as part of the first phase of industry assessment. Upon the request of KPEP, a local consultant was hired to conduct the assessment with directions provided by MDC-Ti.Net.

MDC-Ti.Net was responsible for providing following deliverables:

1. An inception work plan and projected schedule at the beginning of the assignment.
2. Assessment Report of Kosovo Plastic Recycling Industry.
3. Kosovo Plastic Recycling Feasibility Study (Operational and Financial).
4. Draft final report.
5. Deliver training for KPEP staff on legislation on Packaging and packing waste.
6. Final report.

## BACKGROUND

The first step in plastic waste recycling is **collection** of already used plastic packaging. Many **campaigns**, so far are practiced for increasing public awareness to be actively included in plastic waste collection and primary sorting. The most of plastic bottles are made of two polymers: PET and HDPE, LDPE.

The second step is **separation, sorting and cleaning** as a central part of a plastic recycling process. Collected bottles should be sorted to marked specifications, which maximize their value.

The next step is **baling**. Plastic bottles should be baled by re-processor specifications and final step is **recycling**.

Prior to the establishment of the USAID Plastic Recycling Project in Macedonia none of the processes mentioned existed. In order to achieve PET recycling in Macedonia the Plastic Recycling Project (PRP) Macedonia in the past three years worked on the following components:

1. Support collection and recycling companies in developing their business and obtaining environmental certification documentation;
2. Implement PET collection program in municipalities;
3. Create public awareness through public campaigns on national and local level;
4. Build municipal capacities in plastic waste management (including training in how to apply for IPA funds);
5. Establish Plastic Recycling Association PETRA; and
6. Assist the Ministry of Environment and Physical Planning to develop and implement a Law on Packaging Waste that will institutionalize the recycling industry.

Since 2006, progress has been noted in all components of the project.

- Advanced public awareness in environmental protection: Introduced educative curricula on plastic recycling in primary schools and intensive media outreach; Annual Earth Day festivals. Realizing that public awareness is essential for the success of the Project, the MDC-TI.Net implemented Plastic Recycling Project has emphasized organizing public awareness events and promoting Project activities. The MDC-TI.Net through USAID Plastic Recycling Project organized several promotional campaigns and participated in various events – the high point being the organization of the Earth Day event in Skopje in 2008/ 2009. The effects from the Public Awareness campaign are already visible – the population is informed about Project activities and is aware of the benefit to their community from the PET Collection system that is being established
- Developed a business model and job creation for recycling industry: Increased collection of PET waste from 350 tons in 2005 to 6,000 tons in 2008; generated earnings for 5,000 people in the industry
- Introduced international experience in Municipal plastic waste strategies
- Initiated compliance with national environmental legislative for 10 companies
- May 16, 2008 the PET Recycling Association of Macedonia (PETRA) was formed. PETRA is an organization consisted of different entities that are directly involved in the process of PET collection and recycling
- Assisted entrance of five recycling companies since 2006.

- Assisted in Drafting the Law on Packaging Waste that regulates the “producers’ responsibility” to organize the collection and recycling of PET will be fully implemented in 2012.
- Municipalities introduced the PET Collection Program and recognized its benefits. Several Municipalities led by city of Skopje made budget revisions to purchase additional 500 PET containers.
- Established dialog between the business community and the national and local authorities.
- Recycling businesses equipped and trained to ensure growth of the recycling industry.
- As a result of the support provided to the Ministry of Environment and Physical Planning, the process of finalizing the Law on Packaging and packing waste includes comments and suggestions provided by the representatives of recycling industry, municipalities and NGOs. In order to achieve this goal, MDC-Ti.Net organised round tables, workshops, and study visits. Experts from Bulgaria were invited to provide transfer of their experiences, as well a group consisted of partners and stakeholders from Macedonia visited Slovakia and Bulgaria to get acquainted with diverse existing models.

Thus as it is with the Macedonia Plastic Recycling Project, the focus of the Kosovo Plastic Recycling assessment reveals the importance of communicating plastic recycling to the community including all stakeholders in establishing plastic recycling programs in Kosovo.

The focus of this assessment is concerned with collecting, baling, transporting, grinding, processing, promoting, and selling PET recycled waste. The assessment also focuses on establishing networks and including all stakeholders in the process of waste management.

## EXECUTIVE SUMMARY

The market survey "Plastic Recycling industry Assessment" was undertaken as part of the first phase of a larger activity to follow based on the findings of this phase. The objective of the overall activity is to enable initiation of an organized plastic waste collection and recycling in Kosovo.

The entire survey and the preparation of this document were performed by the MDC TI Net. in the period September 01 - September 25, 2009. This market survey was based on the questionnaire that has been prepared by MDC TI Net. The data collection was carried out through an extensive desk research, by using telephone-interviewing techniques and primarily through direct visits to companies.

The research was conducted on 48 entities out of which 21 are plastic recycling enterprises. Although, it did not cover all enterprises involved in plastic processing, the authors believe that the major players in this industry segment have been included, thus the conclusions in this report are relevant. The survey included plastic processors, beverage producers, trading companies, recycling companies, public entities, and donors.

The questionnaire consisted of three groups of questions. Each of these groups contained questions pertinent to the main objective. The groups of questions were:

1. General information - this section included questions regarding the type of organization, its activity, number of employees etc.
2. Current production - products, plastic materials used, annual consumption of plastics by types etc.
3. Recycling activities - questions regarding current recycling activities including recycling of own technological waste, use of recycled materials for production, future plans.

This report describes the findings of this survey and it is prepared in a manner that corresponds to the groups of questions in the questionnaire. Each group of questions is regarded as separate from the others. However, correlation was made in places where it was deemed necessary for the purpose of making conclusions and recommendations.

No individuals ("Authors") involved in the preparation of this document make any representations or warranties as to the accuracy or completeness of the information contained herein. However, the authors believe the information to be accurate and complete.



## FIELD ACTIVITIES TO ACHIEVE PURPOSES

In order to learn about recycling activities in Kosovo mixed team of consultants and KPEP staff visited 48 companies; stakeholders that involve government officials; municipal representatives; civil society organizations; donors' community.

The project was carried out in the following phases:

- Desk Research and listing of all plastic processing companies;
- Design of a questionnaire;
- Design of basic electronic database for input of gathered data;
- Direct contacts and visits with the plastic processing companies;
- Data analysis;
- Write-up of the final report.

Each of the interviewed representatives of the respective recycling companies answered a set of questions included in the questionnaire designed for this particular assessment.

The teams usually scheduled 3-4 meetings pending of the location of the facilities or entities that were visited.

In order to obtain additional in-depth information some of the meetings were rescheduled and conducted by Arian Toska, COP, MDC. TI Net.

The table of visited companies and stakeholders is available as Annex II.

## **I. Assessment of Kosovo Plastic Recycling Industry**

The process of plastic recycling may be defined as taking post-consumer and post-industrial plastic and processing this material into a different form, or eventually product. Kosovo is suspected to have a tremendous amount of plastic waste in its landfills. The plastic recycling industry for Kosovo is very new and it may be said still in the dawn of its development. Based on the 2008 report "Waste in Kosovo", plastics consist of 9.4% of total waste collected by licensed waste management companies, which means 218,000 tons yearly. Waste management companies service only 60% of the total population in Kosovo. According to a report produced by Kosovo Environmental Agency in 2008 on Analysis and Evaluation of Waste in Kosovo in 2008, reveals that 34 percent of the volumes of household generated waste are plastic.

In accordance with the assessment results there are four types of plastic that is most frequently collected: PET (Polyethylene Terephthalate), HDPE (High Density Polyethylene), PVC (Polyvinyl Chloride), and LDPE (Low Density Polyethylene). PET is the least collected material by interviewed companies. Initially due to the low price and poor demand in the first quarter of 2009 caused by the world economic crisis, for detailed explanation of reasons please refer to the chapter operative feasibility study.

### **A. Assessment of Kosovo Plastic Recycling Industry**

#### **I.1 General Information**

The general information section covered the following:

##### **I.1 City**

The survey covered a total of 21 enterprises from 5 cities in the country. The majority of companies are in the largest cities in Kosovo: Ferizaj/Uroševac, Pristina, Shtimje/Štimje, Lipjan/Lipljane, Prizren, Podujevë/Podujevo, etc. The total number of companies in these cities is 15, accounting to 70% of the total number of interviewed enterprises.

##### **I.2 Type of company**

The majority of companies are Limited Liability Company Established by One Person. One subject is not registered as a legal entity; however the same plans to get registered soon.

##### **I.3 Year established and number of employees**

Almost all entities were established in the period after 1990. The total number of employees in the surveyed companies is very small with Cadi commerce leading in the industry with 18 full time employees. The majority of enterprises have between 0-5 employees.

##### **I.4 Sales**

The total sales in the surveyed companies can not be determined as most of them were not open to provide such information.

## II. Products

### II.1 Polyethylene (PE)

Polyethylene melts at 115°C to 120°C and has a relatively low density (PE-LD) of 0.918. (PE-HD) has a more crystalline structure and a higher melting point, i.e. a very much stronger material. Polyethylene is an excellent electrical insulator. It can be used for a multitude of different purposes ranging from household appliances and industrial equipment to toys.

The highest participation in the total processing of plastics in Kosovo is taken by the polyethylene, i.e. LDPE and HDPE. They constitute the majority of total processing of plastics, or about 2,500 tons. Main products made by polyethylene are the following:

- foil for agriculture;
- drainage pipes;
- shopping bags (printed and non printed);
- bottles, containers for food, bottle caps;
- thermo foil for wrapping; etc.

The expected annual waste of polyethylene is about 8,000 tons. The forecast for annual waste of polyethylene is derived as follows:

The polyethylene drainage pipes 1000 tones;

Agriculture foil is about 1,500 tons a year;

The production of bags for industrial packaging, packaging foil, shopping bags and various PE containers (such as ketchup bottles) together is about 2,500 tons a year;

Of 21 interviewed companies, 14 of them (66,6%) are involved in the processing of PE.

- The production of **agriculture foil**;
- The production of **bags for industrial packaging, packaging foil, shopping bags**;
- Various **PE containers (such as Ketchup bottles)** and other injection molding parts;
- The production of polyethylene **pipes** for water supply and sewerage systems.

The largest companies in the polyethylene processing are:

Company name	City	PE (tons)	Product description(Annual)
Çama Komerc	Ferizaj/Uroševac	Not available	Shredding
Pista Ekoplast	Rahovec/Orahovac	1,600	Plastic pipes for electrical instillations, electric sockets, and crates for flowers, water pipes, and water hoses
ALCOM	Lipjan/Lipljane	130	Collection and shredding
Lulebora	Lipjan/Lipljane	Not available	Collection and shredding

Samira Plast	Ferizaj/Uroševac		Foil, bags
Mbrojtja e Ambientit	Ferizaj/Uroševac	12	Bailing
Plas-Kos	Pristina	1000	Production of granules
Tiki-Niti	Ferizaj/Uroševac	550	Collection and shredding
Metal Elektro	Ferizaj//Uroševac	36	Collection and shredding
Rival	Gjilan/Gnjilane	24	Collection and shredding
Rec-Kos	Fushë Kosovë/Kosovo Polje	120	Collection and shredding
Rrezi-Com	Gjilan/Gnjilane	24	Collection and shredding
PAJA	Ferizaj/Uroševac		Collection and bailing
CADI COMMERCE	Ferizaj/Uroševac	150	Production of brooms and brushes
Euro Plastika	Pristina	Not available	Production of granulate

## II.2 Polyethylene Terephthalate (PET)

PET is clear, tough and has good gas and moisture barrier properties. This plastic is commonly used in PET soft drink bottles and many other injection-molded consumer product containers. Other applications include strapping, molding compounds and both food and non-food containers. Cleaned, recycled PET flakes and pellets are in great demand for spinning fiber for carpet yarns and producing fiberfill and geotextiles. Polyester is its nickname. Main characteristics are clarity, strength/toughness, barrier to gas and moisture, resistance to heat.

The annual generated PET waste is about 10,000 tons. This number is expected to grow. More often lately, people start buy regular water for drinking (in bottles) as opposed to drinking tap water.

The largest processors of PET packaging are:

Company name	City	Interest in PET	PET (tons)	Product description(annual)
Çama Komerc	Ferizaj//Uroševac	Yes		Collection and shredding
Pista Ekoplast	Rahovec/Orahovac	Yes		Collection
ALCOM	Lipjan/Lipljane	Yes		Collection and shredding
Lulebora	Lipjan/Lipljane	Yes	15	Collection and bailing
Samira Plast	Ferizaj/Uroševac	Yes		Collection and Bailing
Mbrojtja e Ambientit	Ferizaj/Uroševac	Yes	15	Collection and Bailing
Plas-Kos	Pristina	Yes		Production of granules
Tiki-Niti	Ferizaj/Uroševac	Yes	20	Collection and shredding
Metal Elektro	Ferizaj/Uroševac	Yes		Collection and shredding
Rival	Gjilan/Gnjilane	Yes		Collection and shredding
Rec-Kos	Fushë Kosovë/Kosovo Polje	Yes		Collection and shredding

Rrezi-Com	Gjilan/Gnjilane	Yes		Collection and shredding
PAJA	Ferizaj/Uroševac	Yes	30	Collection and bailing
CADI COMMERCE	Ferizaj/Uroševac	Yes		Collection and production
Kroni	Rahovec/Orahovac	Yes	50 (2008)	PET flake, PET Granulate
Tefik Canga	Ferizaj/Uroševac	Yes		Interested to invest in production of PET flake
Euro Plastika	Pristina	Yes		Production of granulate

There is only one value added PET recycler in Kosovo; the name of the company is Kroni. The Company was established in 2009 and stands as individual business of Mr. Agim Kroni. Investments made in the line of recycling capture the value of 220,000€. The set of equipment includes also PET waste extruder to produce PET granulate. At the moment there is no demand for PET granulates from post consumer waste.

Kroni at the very beginning of its operations is encountering numerous technical problems; the installation of the machines has lasted for 6 months with an ineffective launch. Following the installation of the machines due to lack of technical knowledge the grinding machine gets broken and has not been repaired yet. The quality of the produced PET flake has not been tested for purity. As told by Agim, the first shipment of PET flake to the Italian buyer has revealed that the goods have been contaminated with PVC.

Mr. Kroni lacks technical as well as business knowledge, the conversation with Mr. Kroni has revealed that he is also lacking working capital and is thinking of going back to Italy where he was previously employed.

Kroni should not be considered as existing value added investment till it resolves technical, business and financial issues.

The only recycling company encounters technological, financial and administrative problems, the MDC TI Net. team proposes Kroni to resolve technological processes first (assess necessary interventions with the grinding machine and make necessary interventions to enable restart of the production process), second, test the quality of the PET flake produced and third assess its financial capacity to restore collection activity. Assessing financial capacity is important as he owes to pay collectors for PET waste collected in 2008 and early 2009.

### III. Government institutions

The government institutions are bureaucratic organizations that have limited competencies. However, each plays an important role in waste management and recycling, yet they have no direct communication with each other. Meaning, these agencies are not linked in policy development, and other areas beyond their presence under the Ministry of Environment's umbrella. The interviews with government officials/civil servants of MESP and EPA are very clear that they lack capacity to implement the current legislation. The conversation with the Environmental Protection Agency has revealed that Kosovo has adopted the EU Directive on Packaging and Packaging waste and awaits implementation; on the other hand the head of the waste management sector within the ministry of environment informed of the process of drafting the law on creating the Environmental Fund based on the polluter pays principle.

#### **IV. Civil society**

Local NGOs are very active in Kosovo, campaigning for cleaner environments and cleaning cities. The majority of their programs focused on the cooperation of civil society with government institutions and stakeholders. It is apparent by the activities and programs of the NGOs, that the first step a cleaner environment is instilling awareness in the general population that 'waste is more than garbage lying on the side of the road or in a park'. In general, the organizations have experience strong support and interest from citizens and beneficiaries during the initial stages of their programs. However, over time, this decreases and eventually the programs end without developing sustainability (without continued donor support). All NGOs expressed interest in participating in any campaign efforts related to plastic recycling. The advantage is that these organizations have created a network and this would be very important to utilize for future campaigns.

#### **V. Donors**

With the current process of transferring more of the responsibilities and the authority from the central government to the municipalities, the municipalities will have higher power to do more about the treatment of the PET waste.

In addition, the Ministry of Environment and Spatial Planning in cooperation with the REC initiated the development and implementation of Local Environmental Action Plans in 5 municipalities (Pejë/Peć, Gjiilan/Gnjilane, Gjakovë/Đakovica, Ferizaj/Uroševac and Prizren). The first findings of the LEAP processes in the five municipalities have ranked waste management as issue number one. The Regional Environmental Center will contribute 40,000 Euros per each municipality in implementing the priorities; on the other hand municipal contribution will be in the amount of 20,000 Euros per municipality. REC director has requested close cooperation with KPEP in case KPEP decides to support plastic recycling in Kosovo. He strongly believes that cooperation can result in successful outcomes.

GTZ has provided technical support to municipality of Pristina in applying with EC for a project in establishing integrated waste management in Pristina. Components of the project address collection and recycling of packaging waste as well as public awareness in the municipality. It is recommended that close cooperation is established with authorities of Municipality of Pristina, GTZ as well as delegation of the EU Commission in Kosovo. The Project is awaiting approval from EU Commission; the approval is expected after local elections.

## B. IDENTIFYING RECYCLED PLASTIC PRODUCTS AND MARKETS

### 1. SUMMARY

PET Plastic is the resin of choice for carbonated soft drinks.

To be sold in high value-added markets recycled PET Plastic must be almost entirely free from contamination. If not readily removed during the recycling process the barrier materials will degrade the PET regrind to the point where high value markets would be excluded.

From the perspective of local recycling programs, designers are called on to configure PET bottles such that:

- The bottle, including its cap, label and color components can be recycled without increasing the current cost of PET reclamation.
- The resultant recycled PET flake stream meets the performance specifications for high-end paying bottle markets.

Economic viability should be a criterion equally as important as consumer acceptance. By collaborating at an early stage the needs of packagers and recyclers can both be met, and thus the ability of brewers to roll out a plastic bottle for their product in a reasonable time frame should not be restricted.

Even though the major focus of this project is PET Plastic recycling, this part of the complete report contains information about products, prices and sources of information on customers for the following plastics:

- Polyethylene Terephthalate - PET,
- High Density Polyethylene - HDPE
- Low Density Polyethylene - LDPE.

## 2. RECYCLED PRODUCTS AND END MARKETS

### 2.1 Recycled PET

In the last two decades a lot of experience has been obtained on PET recycling, enhancing the technological possibilities and resulting in more and more outlets for RPET (Recycled PET), depending on market prices. To enable a further growth in RPET sales it is essential that new outlets be developed.

A successful recycling program depends not only on collecting the empty bottles recyclable must also be made into products that people want to buy.

Thanks to the continued investments and innovations of manufacturers and recycling engineers, there is no shortage of excellent new uses for recovered PET (RPET).

#### RPET Product Categories

RPET used (Thousand Tones)

	2004	2005	2006	2007	2008
<b>Fiber</b>	592	620	715	817	1052
<b>Sheet &amp; Film</b>	89	91	89	95	95

<b>Strapping</b>	75	98	120	140	201
<b>Engineered Resin</b>	44	56	60	76	77
<b>Food &amp; Beverage Bottles</b>	44	41	52	78	74
<b>Non-Food Bottles</b>	71	73	87	90	120
<b>Other</b>	1	1	7	9	5

The main end use markets for PET bottle recycled may be summarized as:

1. Fibers

- Staple

2. Packaging

- A-PET sheet

- Containers (food / non-food)

- Beverage bottles, household detergents and shampoo bottles

- Strapping

3. Others

- Chemical recycling

- Engineering resins

- Polyols

- Mixed plastics

- Incineration

Staple fiber applications are currently the largest end-use markets for post consumer PET. However, the production of food contact grade PET has the potential to provide a high value market for all clear post consumer recycled PET, given reprocessing capacity and favorable legislation and economics. Both applications usually require only clear or lightly tinted bottle feed due to the problems associated with achieving a consistent color when using previously colored PET.

Markets for colored PET recycled are more limited; mechanically recycled flake retains its original color and hence if the product is to be reused, markets must be found which can accommodate this. The following markets can accommodate colored flake:

1. Textiles

2. Packaging

3. Strapping

4. High Intrinsic Viscosity Applications

5. Chemical recycling

Contamination of recycled PET Plastic with PVC can be a major problem affecting



the mechanical recycling of PET bottles. PVC can be difficult to separate due to visual similarity and overlapping density range. Applications such as staple fiber, A-PET sheet and strapping tape are relatively forgiving of particulate contamination as these processes have in-line melt filtration and may therefore use bottle flake feed. Applications such as bottle blowing are more demanding and generally require feed to be re-palletized via a melt filter.

Almost 60% of (Eko Eras, Greentech's, ERH Plastic's) end product (clean PET Flakes) has Staple Fiber application. In the second half of 2009 the world demand for clean PET flakes for Staple Fiber has increased. The biggest reason is the reactivated demand coming from China's fiber market. The predictions for 2010 show the same trend, big demand for Staple Fibers applications.

The main end markets for the Clean PET Flakes produced by Eko Eras, Greentech and ERH Plastic are Far East (especially China) and Western Europe.

### 2.1.1 Fibers

Fibers are ideal use for recycled PET because they require less expensive grades and processing than other end uses.

The fiber industry is still one of the most important markets for RPET. 62% of the recovered PET produces polyester fibers.

The PET recycled fiber industry can be broken down into three divisions; staple, filament and spun bonded. Staple and filament fibers are similar products, but differ in length and are used in different applications.

'Staple' describes fibers that are between 5 and 150 mm in length, with a thickness of 1 - 100 denier. Staple fibers are commonly used for 'fiber-fill' insulating material in products such as anoraks, duvets, automotive industry and sleeping bags.

Filament fiber is a less significant market for mechanically recycled PET. There is existing trend to reduced European staple fiber production and source with fabrics or cheaper fiber from Asia.

Recycled PET is also used to spin smaller diameter fibers. These can be woven into fleece fabrics for products such as jackets and scarves. Such fabrics can contain over 95% and up to 100% recycled content. Major outdoor clothing companies already recognize the benefits of these "recycled garments" and are introducing new ranges. A "recycled" fleece jacket uses 25 PET bottles.

Polyester fibers are being engineered to provide the same qualities as upholstery foams. 35%-recycled content has been introduced to these advanced hollow "conjugated" polyester fibers.

### 2.1.2 Packaging

Four main types of packaging product may be produced from post consumer PET bottle recycled: amorphous-PET (A-PET) sheet, containers for food (multiplayer), (single-layer) and strapping.

#### *A-PET sheet*

A-PET is used in a variety of applications such as drinking cups, dairy boxes, vegetable/ fruit punnets, boxes, lids, cartons, caps etc. The A-PET market is particularly price sensitive. PET market share is dependant upon the price of PET sheet relative to sheet produced using other polymers such as PP, PS, PVC.

### *Containers - food-contact*

The on-going development of technology now enables 'closed loop' bottle-to-bottle recycling of PET. Legislation remains a significant factor affecting this market. PET bottles with PCR content were introduced in the United States in 1991 and have subsequently been used in a range of countries including Australia, New Zealand, Switzerland, Sweden and the UK. However, other countries including Italy and Spain have yet to license any processes for food contact grade PET. In some cases the recovered PET is added into the packaging as a sandwich layer, between two layers of virgin polymer. This is known as "multi layer" technology.

Manufacturers predict multi-layer bottles can contain at least 50% recovered PET. Single layer containers can use even higher quantities of recycled material than this. All these containers remain recyclable. The availability of 'food grade' RPET will possibly enhance the use of RPET in new soft drink bottles. This is, of course, dependent on market prices. Multi-layer soft drink bottles using recycled PET are on sale in a number of countries worldwide, including Switzerland and Sweden. This application is expected to spread rapidly once regulations and conditions of testing are formalized in legislation. The use of recycled PET will have to be commercially competitive with the use of virgin PET. However, multinational companies whose corporate policy and shareholder pressures are driving them towards the greater use of recycled in bottle manufacture dominate the industry.

### *Containers - non-food contact*

Whilst the specification / quality of recycled required is high, specifications are not as demanding as those for food contact applications. Non-food contact PET container uses include bottles for detergent or household products, which are frequently colored; in such markets recycled PET may compete with virgin PVC, HDPE and PP, trends in the (Chemical household industry) is fast replacing virgin PVC, HDPE and PP with RPET.

### *Strapping*

Steel strapping is used in a wide range of demanding applications requiring strength, for example construction. Safety issues such as sharp edges and the effect of a sudden break under tension have resulted in the widespread replacement of steel with other materials, including PET and PP.

Polypropylene is the lower cost alternative, however it can only be applied to less demanding functions, for example transit packaging. PET is the strongest of the plastic alternatives to steel, but is more expensive, which has limited its use in mass applications and restricted its use to those applications where strength is essential.

PET has several significant advantages over steel: greater safety, non-rusting, cleanliness and the ability to heat-seal reducing binding time.

Polyester strapping has developed as a significant market for RPET, competing directly with both steel and polypropylene. The quality requirements for this market are however very high (IV = 0.7-0.8 dl/g -1). The market is largely supplied by off-spec material and blends sourced from specialist blenders. Strapping requires recycled with a very low level of contamination as well as a high, regular viscosity.

## **2.1.3 Other Applications**

### *Chemical Recycling*

This end-use involves the break down of the PET flake chemically into chemical precursors, which are then made available for re-polymerization or other chemical processes. Recycling PET in this way is relatively costly and there is much debate

surrounding the quality of flake required. Some manufacturers claim levels of PVC contaminant up to 5-10% can be tolerated, although others require much higher quality flake.

#### *High Intrinsic Viscosity Applications*

PET with high IV (>0.8 dl/g -1) may be used in a wide range of applications including: tire cord, fishing nets, airbags, car mats, roofing materials, landfill cover, fibers for conveyor belts, reinforced fiber matrix etc. Such applications appear to have the potential to be highly profitable.

#### *Polyols*

The partial de-polymerization of PET by glycolysis yields an intermediate product (polyol) that can be used to produce polyurethane 5. The use of PET in this application adds little value and is therefore considered unlikely to become a major use of post consumer bottles.

The following table illustrates the difference in price between the prices of the major PET products; resin, fiber, sheet and strapping. Products that add higher value to recycled are likely to have greater potential for profitability. However, there are still issues to address relating to use of RPET in food contact applications.

<b>Prices of PET products (September 2009)</b>	<b>EURO/tonne</b>
Virgin PET Resin	1,400-1,700
Fiber Chip	2,000-2,100
Staple Fiber	2,000-2,450
A-PET Sheet	2,500-2,750
Strapping	2,550-2,950

All these markets are promising. There is currently a far larger demand for recovered PET than supply currently available.

#### 2.1.4. PET Bottles

With almost 70% of all consumer beverages in Europe and the USA being sold in PET bottles, and annual world growth rates regularly reaching two figures, it has become abundantly clear that the classic market for recycled PET (textile fibers, strapping, automobile moldings etc) will not be big enough to absorb all of this post-consumer material. The growth in PET beverage containers is itself also on the verge of requiring a regular and reliable supply of recycled material simply to meet demand.

There is a growing pressure in some countries for the large PET bottle producers to use recycled content in the production of new bottles. Presently Coca-Cola uses plastic bottles with recycled content in New Zealand, in Australia, and in several European countries.

The project director of the Plastic Redesign Project (PRP) stated that the Coca-Cola Company has spurred a revolution in the economics of plastics recycling, with its decision three years ago to establish a public goal for using recycled content in PET bottles.

The company made the ground-breaking commitment in 2000 to use 20% recycled content in its plastic bottles by 2010, culminating its years-long work to help commercialize recycling PET bottles from curbside programs into new bottles.

In February 2003, The Coca-Cola Company received an award from the PRP, as it reached a milestone in that commitment, with 10% recycled content in 80% of its bottles.

#### 2.1.5. Major Grades Included in the PET Recycling Category

Following are the major grades in recycled PET at the world markets:

**Baled Mixed PET Scrap** consists of assorted PET bottles or containers compacted into secure bundles with a minimum weight density of 10-lb./cubic foot (160kg/m<sup>3</sup>). May contain Post Consumer PET Bottles of mixed colors.

**Baled Colored PET Scrap** consists of sorted PET bottles or containers compacted into secure bundles with a minimum weight density of 10-lb./cubic foot (160kg/m<sup>3</sup>). Must be sorted into a single color. May contain Post Consumer PET Bottles of a single color.

**Baled Clear PET Scrap** consists of sorted clear (transparent) PET bottles or containers compacted into secure bundles with a minimum weight density of 10 lb./cubic foot (160kg/m<sup>3</sup>). May contain clear Post Consumer PET Bottles.

**Colored PET Re grind** consists of reground (crushed) sorted colored PET bottles or containers. Usually it is considered that washing process is included.

**Clear PET Re grind** consists of reground (crushed) sorted clear (transparent) PET bottles or containers. Usually it is considered that washing process is included.

#### 2.1.6. Prices

Following are the world market prices for Major Recycled in categories

September, 2009:	World Market Prices	Prices In Macedonia
Baled Colored PET Scrap	250-300 US\$/MT	200-250 US\$/MT
(Green, Blue, Brown)		
Baled Clear PET Scrap	400-450 US\$/MT	350-400 US\$/MT

Colored PET Regrind	550-600 US\$/MT	300-400 US\$/MT
Clear PET Regrind	650-700 US\$/MT	400-500 US\$/MT
Clear PET Flake	900-1100 US\$/MT	
Virgin PET granulate	2200-2400 US\$/MT	

These prices are transportation to buyer included.

## 2.2 Recycled HDPE (High Density Polyethylene)

The main applications for HDPE bottle recycled are:

1. Packaging products (e.g. blow-molded bottles)
2. Extruded products (e.g. drainage pipe)
3. Sheet and film products (e.g. blown film bags, extruded film products)
4. Pallets
5. Plastic lumber products.

Unlike the RPET applications, the applications for recycled HDPE are more locally oriented. The end markets for recycled HDPE are present at every market, no matter its size.

As with PET reprocessing, mechanical recycling is unable to remove color from feed material, hence uncolored 'natural' HDPE can be used in second life applications where colored HDPE may not be appropriate. For this reason natural HDPE commands a higher price than colored HDPE

Mechanical recycling of HDPE is broadly similar to PET reprocessing, although product specifications may be less demanding since the incompatibility of HDPE and PP (the principal contaminant of pcr HDPE) is less severe than PET / PVC and food contact recycling of pcr HDPE is yet to be established as a commercially viable proposition. Shredded HDPE bottles may be used directly in some applications, however, it is more common to re-compound (re-extrude / palletize) the HDPE prior to reuse.

Mechanically recycled HDPE may be used either at 100% or blended with virgin HDPE in a wide range of applications which mirror the applications of virgin HDPE.

### 2.2.1 Packaging Products

HDPE recycled may be used for a range of packaging products, including blow-molded bottles, where multi-layer extrusion is used to produce bottles with recycled HDPE sandwiched between layers of virgin HDPE. Plysu have produced multi-layer extruded HDPE containers since the early 1990's. These are however, not used for food contact applications, but are used for products such as engine oil, shampoo and concentrated washing liquid.

### 2.2.2 Environmental products

There has been a rapid growth in the production of environmental products including: collection boxes for recyclable materials, compost bins and wheeled bins. Linpac Environmental produces such products using post consumer bottles and industrial scrap, including material sourced from the UK.

### 2.2.3 Extruded products

Delleve plastics produce twin wall pipes manufactured from recycled HDPE and PP, including container tops, HDPE barrels and plastic bottles.

### 2.2.4 Plastic wood products

Plastic wood products may be produced from single polymer feed (HDPE), mixed polymer feed and blends of polymers with other materials such as sawdust. In general, the greater is the control over the feed material, the greater is the quality and consistency of the product. The wider the range of potential applications the greater is its value.

The majority of HDPE recycled produced by the companies contributing information is used for production of pipes by extrusion (70%), with a further 14% being used for non food-contact applications.

The market for HDPE recycled depends on the quality of the material. Color and odor, especially in case of soap bottles, can be blocking factors for reuse. The reason is that the odor of these products is difficult to remove during the reprocessing. Furthermore, the color of a mixture of colored HDPE bottles is gray/green and is hard to change to other colors, limiting the potential outlets (pastel colors often required).

Concerning the mechanical properties, the HDPE recycled is comparable to the virgin material so long as the sources are comparable. For that reason it can very well be used in low quality or multi-layer applications, such as new bottles, extrusion applications (sheet, pipes) or injection molding products (containers, buckets). HDPE recycled from HDPE bottles has to compete with production waste and off-spec material, which finds a lot of application in new bottles, pallets etc.

### 2.2.5 Major Grades Included in the HDPE Recycling Category

Following are the major grades in recycled HDPE at the world markets:

**HDPE Mixed Post-consumer Scrap (baled)** consists of assorted High Density Polyethylene (HDPE) bottle and container scrap compacted into secure bundles with a minimum weight density of 10-lb./cubic foot (160kg/m<sup>3</sup>).

**HDPE Sorted Color Post-consumer Scrap (baled)** consists of sorted High Density Polyethylene (HDPE) bottle and container scrap compacted into secure bundles with a minimum weight density of 10-lb./cubic foot (160kg/m<sup>3</sup>), sorted to a single color.

**HDPE Clear Post-consumer Scrap (baled)** consists of sorted clear or natural High Density Polyethylene (HDPE) bottle and container scrap compacted into secure bundles with a minimum weight density of 10-lb./cubic foot (160kg/m<sup>3</sup>).

**HDPE Sorted Color Post-consumer Regrind** consists of reground flake of sorted High Density Polyethylene (HDPE) bottle and container scrap, sorted into a single color.

**HDPE Colored Repro** consists of uniform pellets of reprocessed (re-extruded) colored High Density Polyethylene (HDPE).

**HDPE Clear Repro** consists of uniform pellets of reprocessed (re-extruded) clear or natural High Density Polyethylene (HDPE).

### **2.3 Recycled LDPE (Low Density Polyethylene)**

Outlets for recycled of the industrial and commercial films can be found in several sectors:

- Garbage bags
- Silage films, horticultural sacks
- Shopping bags
- Films for applications in construction
- 10 – 20% ad mixture in new shrink films
- Other industrial packaging and non-packaging applications (e.g. pipes)

Same as recycled HDPE, the applications for recycled LDPE are more locally oriented. The end markets for recycled HDPE are present at every market, no matter its size.

So far no recycled (either arising from food packaging or distribution films) is allowed in food packaging. As food packaging has a large share in the consumption of packaging films this implies that a large part of the film market is not available for closed-loop use of recycled material.

#### **2.3.1 Major Grades Included in the LDPE Recycling Category**

Following are the major grades in recycled HDPE at the world markets:

**Mixed LDPE Scrap (baled)** consists of assorted Low Density Polyethylene (LDPE) scrap, compacted into secure bundles with a minimum weight density of 10-lb./cubic foot (160kg/m<sup>3</sup>).

**Colored LDPE Scrap (baled)** consists of sorted Low Density Polyethylene (LDPE) scrap, sorted into a single color and compacted into secure bundles with a minimum weight density of 10-lb./cubic foot (160kg/m<sup>3</sup>).

**Clear LDPE Scrap (baled)** consists of sorted clear or natural Low Density Polyethylene (LDPE) scrap, compacted into secure bundles with a minimum weight density of 10-lb./cubic foot (160kg/m<sup>3</sup>).

**Colored LDPE Regrind** consists of sorted reground flake of Low Density Polyethylene (LDPE), sorted into a single color.

**Mixed LDPE Repro** consists of uniform pellets of reprocessed (re-extruded) Low Density Polyethylene (LDPE).

**Colored LDPE Reppo** consists of uniform pellets of reprocessed (re-extruded) sorted Low Density Polyethylene (LDPE), sorted into a single color.

**Clear LDPE Reppo** consists of uniform pellets of reprocessed (re-extruded) sorted clear or natural Low Density Polyethylene (LDPE).

### **3. POTENTIAL CUSTOMERS**

There is a well developed exchange of waste PET. Currently, the highest interest for waste PET is in East Asia, primarily China and in Europe, Germany, Switzerland, Italy and Austria. PET Recycling companies exist in the Balkans as well, with Macedonia leading the industry with 5 recyclers processing waste PET into PET flake. Majority of waste PET is used for production of fiber, staple.

There are three Macedonian recycling companies at the moment buying baled PET from Kosovo, these are:

1. Greentech, Macedonia- Located in the city of Skopje
2. Eko Eras, Macedonia- Located in Veles Municipality
3. Erh Plastic- Located in the city of Skopje

There are several web pages that provide the possibility to offer / buy waste PET in various forms: PET lump, PET rock, PET bottle regrind, PET Flake, PET preforms, PET fiber/film etc.

One of these web-pages is: [www.recycle.net](http://www.recycle.net) on which recycler could offer his recycled PET products. Recycler's World was established on May 1, 1995 as a trading site for information related to recyclable commodities, by-products, used & surplus items.

Another web-page is: [www.go4worldbusiness.com/Pets](http://www.go4worldbusiness.com/Pets).



## C. PET Plastic Recycling in Kosovo-Collection Scenarios

### 1. SUMMARY

"Technology is no longer the major barrier to recycling," said Michael M. Fisher, director of technology for the American Plastics Council. "People have to figure a way around the collection problems."

There are various scenarios successfully used around the world. Three major types of collection schemes for PET bottles exist in Europe: Drop-off without deposit (64%), drop-off with deposit (13%) and curbside bank collection (23%).

### 2. WORKING METHODOLOGY

For the purpose of this report, the following sources were used:

- Experiences from other countries (US, UK, Germany, Macedonia, Slovenia);

The required information was obtained through:

- Internet research;
- Plastic Recycling Project in Macedonia;
- Phone call interviews.

This research concentrates on the experience from Macedonia, which in many aspects is similar to Kosovo - level of recycling, current legislation etc.

### 3. TYPES OF COLLECTION SCENARIOS

#### Collection Scenarios

Three major types of collection schemes for PET bottles exist in Europe: Drop-off without deposit (64%), drop-off with deposit (13%) and curbside bank collection (23%).

In Belgium the bottles are collected in PMD-bags (plastics, metals and drink packaging) through a curbside collection system. Refill and deposit is most common in Scandinavian countries, The Netherlands, Germany, Switzerland (not for single use bottles) and Austria. PET deposit programs are achieving very high return rates (up to and even over 95%) with very low levels of contamination. In Austria and Germany (both countries support the green dot system) the deposit and curbside/bottle bank systems exist side by side. In Italy over 40% of the population has access to some 24,500 PET "igloos" or containers. Bottle banks are becoming well established in countries such as Switzerland (over 12,000 drop-off points for single use bottles), France (over 5,000 sites) and the UK (over 3,000 sites).

An important difference between these collection systems is the type of bottle collected. In deposit systems only PET bottles for water and soft drinks will be collected. In all other systems this waste stream may be 'contaminated' with PET bottles for other products, like oil products, as well as bottles made out of other plastics. This may require the use of different recycling processes in order to obtain the required quality of flakes.

#### Macedonia

The collection method implemented in Macedonia is different from the ones above-mentioned, but step-by-step the country is in process to approach one of the above-mentioned methods.

After collecting, the graded PET bottles are compacted into bales, reducing volumes by up to a factor of 10. Baling ensures cost-effective shipment of 8 to 12 tone loads of bottles from the collecting point to the processing plant.

The involved entities in our collecting system are:

- Waste Management Companies
- Individual informal collectors (Marginalized population)
- Landfill Operators
- Waste Transfer stations
- Recyclable Materials Collector centers
- Producers of PET Pre-forms and Bottles and Fillers

### **Waste Management Companies**

(Account for only 10% of the collected PET Bottles in Macedonia)

These companies are dealing with the waste management in all cities in Macedonia. Most of them are publicly owned (especially in the larger cities), all of the publicly owned utility companies are ownership of the local authorities, in smaller municipalities there are few privately owned public utility operators.

In most of cities these companies are also operating the Landfills. According to the Macedonian Law on waste management, these companies have obligation to implement system for Selective Garbage Collecting, means all recyclable materials like paper, plastic, tires, glass etc., and shouldn't be buried at the landfills. However, prior to the beginning of the USAID's Plastic Recycling Project in Macedonia none of the cities implemented systems for Selective Garbage Collecting. With assistance of the USAID's Plastic Recycling Project formal municipal PET collection programs have been implemented in 24 municipalities covering approximately 80% of the population. Up to now 800 containers to collect PET have been installed in 24 municipalities, approximately 60 to 70 tones per month of PET is collected through this system.

Smaller parts of the PET Bottles are received from companies like: hotels, restaurants, shopping malls etc. At these locations the Waste Management Companies positioned containers for separate recyclable materials. In these cases the collected PET Bottles are with small contamination.

This collecting system can be efficient only by creating in-expensive local transportation. Special truck is used to service the PET collection containers that bring the PET bottles to the recycling yards. The deposit center has to be equipped with baling press. Here the PET bottles are pressed and prepared to be sent to the recycling companies.

These companies are receiving the PET Bottles for free, so they only need to create efficient system for extracting, local transportation and baling.

### **Individual informal collectors (Marginalized population)**

(Account for 75% of the collected PET Bottles)

PET Bottles collecting by individual informal collectors is possible only when the collecting company can afford to pay significant amount for the collected bottles. The Individual informal collectors included in this collecting are from the poorest population categories. The level of contamination of the PET Bottles is pretty high, because the bottles are collected from everywhere: streets, parks, dumps, garbage

containers and landfills etc. At the moment approximately 2000- 5000 individuals are involved in the collection of various scrap materials. The amount for PET waste per KG collected is 0, 10 to 0, 12 Euro cents with tendency to reach 0, 15 cents per Kg in the near future. Individuals collect approximately 40 to 70 KG of PET waste per day.

### **Landfill Operators and Garbage Re-loading Stations**

(Account for 15% of the collected PET Bottles)

In the largest cities in Macedonia, the Landfill Operations account for 10% of the PET collected. The collecting system is simple. The PET bottles are extracted from the rest of the garbage while the trucks are dumping it at the platform, these operations are forbidden. In this case the collected PET Bottles are with highest contamination. The collected bottles are sent to the balling press. After pressing, the PET bottles in bales are ready for delivery. These companies also are receiving the PET Bottles for free, and they only need to create efficient system for extracting and balling.

### **Recyclable Materials Collectors (scrap collection centers)**

(Account for 10% of the collected PET Bottles)

These companies are collecting several types of recyclable materials: iron scraps, non-ferrous scraps, paper, cardboards and plastics. Usually the companies have part of the necessary infrastructure, like: balling press, weighing scale and small collecting points in the cities.

Parts of the PET Bottles are received from companies like: hotels, restaurants, shopping malls etc. Rest of the PET Bottles is received by individual collectors.

For both cases, these companies have to pay for the received PET Bottles, and they have to press them in bales to be sent to the recycler. In this case the expense for PET collecting is higher compared to the previous two. The level of contamination of the PET bottles is low.

### **Producers of PET Pre-forms and Bottles and Fillers**

(Account for 5% of the collected PET)

The producers of PET Pre-forms and Bottles have production waste of about 2-3% from their capacity. The higher level of technology ensures lower production waste (less than 1%). This PET is completely clean (pre-consume). The price paid for this PET material is the highest.

The fillers of the PET Bottles also have production waste. The PET Bottles are almost clean or with very small level of contamination.

#### Prices

Macedonian recyclers are paying to the suppliers the following prices for PET:

PET Bottles (post consume) un-sorted by color and bailed US\$ 250-300 / ton

PET Bottles (post consume) sorted by color and bailed + US\$ 10-15 / ton

PET Bottles (pre consume) sorted by color and bailed US\$ 300-330 / ton

PET Pre-forms sorted by color US\$ 330-350 / ton

The prices are EXW supplier (transport not included) VAT included.

### **Sorting Systems**

Collected non-refill bottles are sorted by material group (PET, HDPE, PVC) and

baled (to reduce volume) before sale to processor.

Bottles collected through a deposit scheme may be sorted manually or by sophisticated reverse vending machines at the central point.

In manual sorting the operators at the central point will pick by hand PET bottles from a sorting line, using simple features to identify the bottles. With training and supervision this approach can produce high quality material. As a reference UK research reports manual sort rates of up to 100 kg per person per hour.

More recently, high speed X-ray and near infrared sensors linked to a central processor and ejector system are being used to speed up sorting and to reduce costs. Automatic bottle sorting systems handling over 1 tone per hour are operating in France, Germany, UK, Italy and Switzerland. Cost saved by this method is about 25% have been identified in independent research by the US Environmental Protection Agency.

After sorting the graded bottles are compacted into bales for transport to re-processors, reducing the volume by up to a factor 10.

### **Sorting system in Eko flor and Provavil- Macedonia**

The sorting system implemented in Eko Flor is manual. The sorting is done on system of 3 conveyers, in 3 colors: transparent, green and blue. The storing of the PET bottles is done in 3 big boxes for separate color. The boxes are connected by system of transport belts for feeding and discharging. This system reduces manual operations.

The sorting line in Eko ERAS, Greentech and ERH PLasticis similar and is composed of following components:

1. Feeding Conveyor (1 unit)
2. Un-Baling Device (1 unit)
3. Sorting Conveyers (3 units)
4. Declined transport Conveyers (2 units)
5. Boxes for storing (3 units)
6. Discharging Conveyor (1 unit)

The percentage of brown bottles is very small, and these bottles are removed and stored in big-bags, before put for processing. The most profitable bottles are the transparent, than the green color, the blue color and last – brown ones.

The PET Bottle market in Macedonia has the following structure by color: 65% Transparent (Clear) color 15% Blue color 15% Green color ,5% Brown color

### **Processing**

PET can be recovered and re-utilized by a wide variety of methods: melt reprocessing, breaking down by de-polymerization to precursors, purification and re-polymerization, and recovery as energy.

At the present time most recycled PET bottles are recovered by mechanical recycling. The PET Bottles cleaned (washed), flaked and either used directly or blended with virgin polymer, before processing in a similar way to virgin polymer. Purity of the PET material is essential, mechanical recycling of PET is particularly sensitive to the presence of PVC. Very small quantities can cause material degradation and even damage equipment during reprocessing. The acceptable level of PVC is less than 0.25%.

Whole bottle sorting equipment is available which is now sufficiently sophisticated and automated to a level which ensures almost 100% separation of PET from other types, including PVC. Chemical contamination occurs by adsorption of contents like flavor, essential oils or similar ingredients used in the product formulations. Contamination can also be introduced by use of the container for purposes other than the original intention e.g. storage of pesticides, household chemicals or motor and fuel oils. Complete removal will require special processing which is a slow process, and therefore reduces productivity. However these occurrences are few. For some low risk applications, like non-food contact fibbers, incidental product contamination is likely to be insignificant. Commercially viable operations generally have a capacity of over 10,000 tones per annum.

More recently also other recycling processes have been developed using a combination of extrusion and solid-state polymerization resulting in a re-granulate with a high purity as well as a considerable higher IV. Such re-granulate can be used directly in the production of new (also food approved) packaging.

A renewed interest in chemical recycling (also known as feedstock recycling) of PET resulted in the development of new processes (e.g. the Eastman process). These processes might influence the mechanical recycling of PET. However, these technologies are still more expensive than mechanical recycling and are regarded to have potentially better opportunities in the recycling of more 'difficult' PET waste streams such as bottles with barrier layers or colored bottles. Compared to mechanical recycling, chemical recycling of PET is to date only applied on a limited scale.

### **Processing in Greentech, Eko Eras and ERH Plastic**

The bottles are received from the collectors in bails. The density of the bales is about 150kg/m<sup>3</sup>. For better compatibility the caps should be removed or the bottles should be punched before pressing. The bottles are usually unsorted by color and with the labels un-taken.

Working stages:

1. Un-baling is the first step of the processing. The packing bands must be removed and bales have to be opened to start the washing process.
2. Removing of the labels and exterior cleaning. This operation is done with water, which cannot be recuperated.
3. Final sorting and checking - is necessary to assure correct sorting by color and removing of foreign bodies or materials in the bottles. The system is manual.
4. Crushing/Grinding – rapidly rotating blades chop the plastics bottles into flakes with dimension of 10-12 mm. The process is carried out in water, which helps to remove labels and other contaminants
5. Washing of the flakes – is done with water at 80°C where cleaning solutions are added.
6. Separation by floating - the PE flakes (the material from which is done the stopper) are separated from the PET flakes.
7. Drying – after drying the percentage of humidity from flakes does not overpass 2%.
8. Packing – is done in big-bags of 500 kg. By packing in this way in a 40" HC container can be loaded 21-24 tones of PET under the form of flakes.

It must be taken in consideration that 10% from the quantity processed is wastage

(85% PET, 5% PE, approx. % representing the labels which are also wastage, and 5% processing rests). The waster for exterior cleaning and removing the labels is irrecoverable.

## **Equipment used**

### **A. Baling equipment**

Most of the bailing presses used in Macedonia have the following technical data:

Type of press Vertical Hydraulic Press Pressing Force 160 KN Maximum Working Pressure 150 bar Electricity 380 V / 50 Hz Dimensions of Press 1900mm x 890mm x 3800mm (LxWxH) Dimensions of Bale 740mm x 540mm x (max 900mm) (LxWxH) Weight of bale 60-80 kg Density of bale 150-170 kg /m3 Productivity 100-150 kg /hour Operators 1-2 Origin Macedonia Price US\$ 8,500.00

### **B. Recycling equipment**

The production line has the following components:

1. Feeding Conveyer (1 unit)
2. Un-Baling Device (1 unit)
3. Un-labeling Devices (2 units)
4. Label Separator (1 unit)
5. Washing Baths (3 units)
6. Sorting and Checking Conveyers (3 units)
7. Crushers (4 units)
8. Friction Washing Device (4 units)
9. Separating Tank (2 units)
10. Drying Device (2 units)
11. Loading Cyclone (2 units)
12. Silo (1 unit)
13. Control Box (1 unit)
14. Steam Boiler (1 unit)
15. Heat Exchanger (1 unit)
16. Hot Water Tank (1 unit)
17. Water Treatment (1 system)
18. Exhaust Gases Absorption (1 system)

Capacity of the line: max. Input 1,300 kg/hour PET Bottles in bales Installed power: 400 KW Power usage: 360 KW (80% of the installed power) Water usage: 14 m3/MT Manpower: 35 workers per shift required area: 1000m2 Price of machinery: US\$ 1,045,000

## **Economic aspects**

From an economic point of view the recycling of PET bottles was attractive because of low transportation costs and the residual value of the PET material after use, especially when the virgin prices were high. However, the profitability of PET

recycling is inextricably linked to the price of virgin PET as supplied to end-user markets. It is estimated that a PET virgin price of 1000euro/ton gives RPET a healthy chance. It should be noted that the end market use dictates the quality of the RPET required as lower grades command a lower price. Another point is that also the export of PET bottles to Asia will keep having a strong influence on the European market for virgin PET and RPET.

The collection and sorting costs of post-consumer waste show a wide range from around 450 – 1000 euro/ton, depending on country and chosen formal collection system.

According to PETCORE (UK) the average costs are:

Collection: 450 euro per ton

Sorting: 200 euro per ton

Processing: 225 euro per ton (for flakes production)

This results in a total of 875 euro per ton.

PETCORE aims a total cost of at 550 euro per ton by reducing the collection costs to 175 euro per ton.

### **Legal, governmental aspects**

EU member states have introduced or are developing national measures to meet the EC Directive targets and other related local objectives. Often, the national targets for PET containers are more demanding than the broad directive targets. Economic instruments are increasingly being employed to encourage waste minimization and packaging recovery. Examples of economic instruments are householder charging and Eco-taxes. In the case of householder charging the local governments require householders to buy special bags in which to set out refuse. Applying a direct cost to the householder for the generation of waste encourages greater recycling. This can reduce the total costs to the municipality and the householder.

### **Social aspects**

Different countries deal with the PET bottles in quite a different way. In The Netherlands consumers were already used to the deposit systems for glass bottles for soft drinks as well as milk, yogurt and dairy products. The change to PET bottles did not change this habit. Also in other countries consumers are willing to return bottles to bottle bank and collection centers. This situation differs to a large extent from country to country.

The soft drink industry strongly supports the collection and recycling of PET bottles, as they are aware of the green image that goes with it. As for the consumers, it may be remarked that, knowing that PET bottles can be recycled into e.g. useful products like sweaters, they can be stimulated to actually collect the bottles.

The co-operation between collection industry, recyclers and reprocessing industry is shaping up well. A good communication between chain parties results in higher quality streams for mechanical recycling. Information about the (reasons for the) required sorting quality as well as control on the sorting centers (which is sometimes lacking) reduces the recycling costs. So the communication between sorting centers and recyclers contributes to higher quality flakes. The higher the quality of the flakes the higher value products (e.g. new bottles) can be produced of the RPET.

In some countries consumers are not aware of the benefits of PET recycling and don't co-operate in the separate collection of PET bottles. This results in PET bottles disappearing into the residual fraction of their household waste. In other countries the

communication about these subjects is very good, resulting in high collection rates, even in bring systems. Also deposit (bring) systems result in a very effective collection of in general high quality bottle waste.

### **Organizational aspects**

Despite the low prices for virgin PET in the first part of this decade, the volume of produced RPET has strongly increased in recent years. The reason is that, driven by EU legislation for packaging and management of packaging waste, the collection of PET bottles is firmly stimulated by the newly founded collection organizations in a number of countries. New recycling plants as well as production plants for reprocessing RPET have been erected.

### **Eco-profile considerations**

The recycling of PET with its high intrinsic quality and with moderate contamination level results in a good quality RPET with a high IV and an excellent transparency (that is, if the flakes are further extruded in combination with SSP treatment). This RPET can both replace virgin PET 1:1 in specific applications or can be added to virgin PET in 10 – 40% concentrations in other applications. This aspect of virgin substitution contributes highly to the positive eco-profile of PET bottle recycling. Otherwise the RPET can be used in fiber applications.

Design for recycling, although not applied by all producers of soft drink and water bottles, may further contribute to the reduction of the share of residual waste of the recycling process, which is an additional positive aspect. The collection and transport are well organized. The contamination rate strongly depends on the chosen collection system and the degree of communication between all chain partners.

### **Conclusions**

In Europe only a few countries concentrate their collection program on the whole range of consumer packaging, rigid or flexible. The majority of the countries have plastic bottles targeted for collection, all including or even concentrating on PET bottles. This implies that large quantities of PET bottles are available for recycling. The good chain co-operation, the well organized collection and transport infrastructure, the availability of sufficient recycling capacity, the high quality of RPET and available outlets, as well as the positive eco-profile: all these aspect together make PET bottle recycling to one of the most successful examples of recycling of post-consumer household waste.

The profitability of PET recycling is inextricably bound up with the price of virgin PET. Only when (part of) the collection costs are paid for by the municipalities combined with virgin prices at a level of around 1000 euro per ton, the profitability of PET recycling might become sufficient to guarantee a stronger financial position for the PET recycling chain.

## **4. POTENTIAL COLLECTION SCENARIOS IN KOSOVO**

In the period September 2009, the MDC TI Net. employees including a local consultant from UBO Consulting carried out a survey of the current plastic situation in the country.

Results of the study showed that:

- There is an increased use of plastics for various purposes, primarily



packaging, due to the characteristics of plastics - cheap, easily processed, light weight, neutral to the substance packaged;

- The world knows of three types of recycling: mechanical recycling; feedstock recycling and incineration for production of energy;
- The raw materials (plastics) are imported in the form of granulate, performs, sheets and finished packaging products;
- The estimated amount of industrial and post consumer waste generated on an annual basis is:  
Polyethylene (HDPE, LDPE) - 4,500 tons;  
Polypropylene - 1,000 tons;  
PVC - 400 tons;  
PET - 10,500 tons
- There is a wide spread primary recycling of plastic materials (primarily polyethylene and polypropylene);
- Secondary recycling is used for polyethylene agriculture foil;
- PET has limited recovery
- The current Kosovo legislation on waste management with specifics to managing packaging waste according to the Ministry of environment has been harmonized with the EU directives, reaching 88% of harmonization; Implementation of the law encounters numerous problems.

The plastic wastes (primarily agriculture foil - polyethylene, car batteries - polypropylene, beer and soft drink cases - polyethylene) are collected together with other recyclables such as cartoons, papers, tin cans, scrap metals, glass and other types of plastic wastes in the following ways:

**Scavenging** - This is a practice of collecting solid waste by means of sorting recyclables from different public sites as a way of making a living. This method is considered as a highly effective and productive recycling system. The scavengers can be categorized according to the following types: a) street scavengers, b) collection crew scavengers, and c) dumpsite scavengers.

**Private Collection** - This type of collection is done in restaurants, hotels, business establishments, supermarkets and fast food chains.

**Junk Shops** - There are several junk shops operating in the country. They collect recyclable items and sort them to separate the plastics from other materials. Most of the junk shops are in the area of Ferizaj and their primary interest is in scrap metal. They buy from scavengers and household consumers. On the other hand, they sell their scrap to the recyclers/processors in Macedonia, Serbia, Albania, and Greece.

**Households** - The collection from the household consumers is inexistent in Kosovo.

**Plastic recyclers** - The recyclers carry out the collection, sorting, washing and drying operations in their plant. Their collections come from the junk shops and others.

The **biggest problem** for the collection and recycling of plastics in general is the lack of demand. There are several recyclers (Please the Kosovo Plastic industry assessment report).

The lack of demand can be described as lack of markets and market information and lack of new products designs as well as lack of knowledge.

## Scenarios

For the purpose of this study several scenarios have been designed based on the experiences from Macedonia and the specifics of Kosovo.

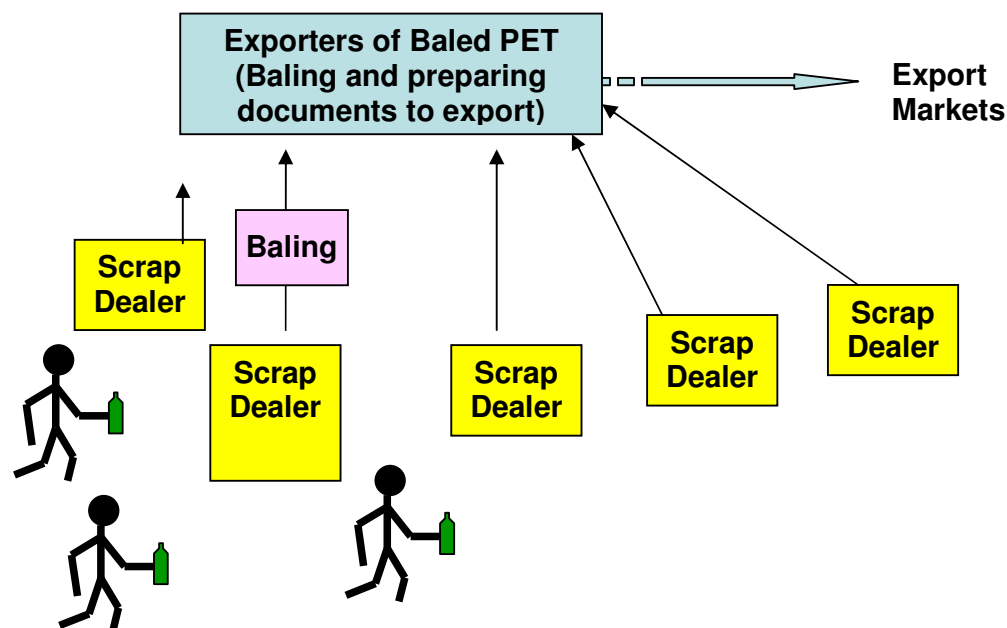
All scenarios are based and concentrated on a recycler - a company, local or foreign recyclers in the neighboring countries (Macedonia) that will be buying the waste PET bottles at market prices, process the bottles and sell the recycled content.

**Ideally the recycler would have experience in recycling PET, would know the technology and markets and will have sufficient financial capacity to carry out the investment in the necessary equipment and working capital (Kosovo has a domestic PET recycler, which posses non of the above characteristics) .**

The successful realization of any of the scenarios proposed, or other, depends upon the final step, which is the marketing and selling of baled or recycled PET.

Currently, taking into consideration technical and other problems encountered by the only recycler (KRONI), we have been developing the scenarios assuming that no processing capacities exist, it is foreseen that in the beginning the market will be export markets for baled PET, primarily neighboring countries and Western Europe as well as China in the later stages.

### Scenario 1: Scrap dealers



Individual collectors and collection crews sell to scrap dealers

The scrap dealers buy the PET bottles collected by scavengers, individual collectors, collection crews, landfill operations and households at a set market price, bale the bottles, store the bales and export the recycler.

Advantages:

- There are over 20 scrap dealers in all bigger cities in Kosovo;
- They have experience and are already involved in the collection and sale of

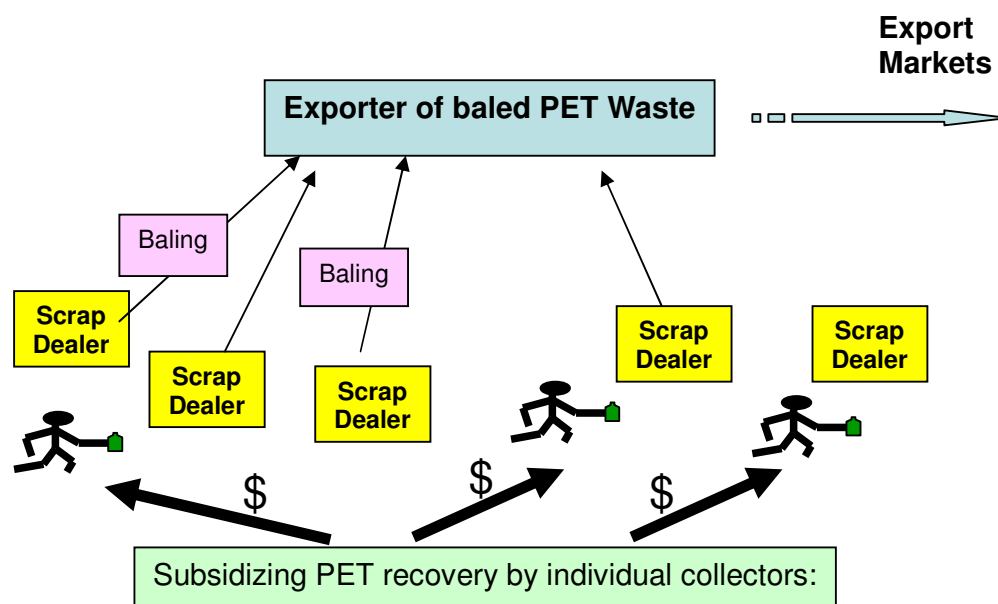
other secondary materials (metal, paper, PE, PP etc.);

- Most of them have appropriate locations;
- Most of them have the necessary equipment (baling presses)
- Most of them are registered by the local government for the realization of this type of activity.

Disadvantages:

- Current buy-off prices are not sufficient to create interest among collectors;
- The current prices per kg are not sufficient to cover cost for the scrap dealers.

### Scenario 2: Individual collectors + Scrap dealers + PET subsidizing



This scenario is a modified version of the previous one. This scenario resolves the issue of the buy-off prices for the waste PET bottles.

In this scenario, KPEP acts to motivate collection, subsidizing collection with individual collectors based on the quantities collected, confirmed by the scrap dealer. Subsidizing should be limited to 0,035 Euro cents or as required lower. Within the first six months subsidizing should be limited to 500 tones of PET. The financial benefits from the subsidizing should end up with the individual collectors. We believe that with this measure higher volumes of PET waste will be recovered thus enabling scrap dealers and exporters to establish longer and healthier relationship between each other as well as enable qualitative relationship with foreign buyers (recyclers) now based on continuous confirmed supply PET waste.

Within the second six months the subsidizing funds should be raised with bottling companies, the fund will be organized and operated by an association of generators of PET packaging companies in close cooperation with PET recycling association.

Advantages:

- PET bottling companies will be involved in the post sale management of their packaging (PET waste);

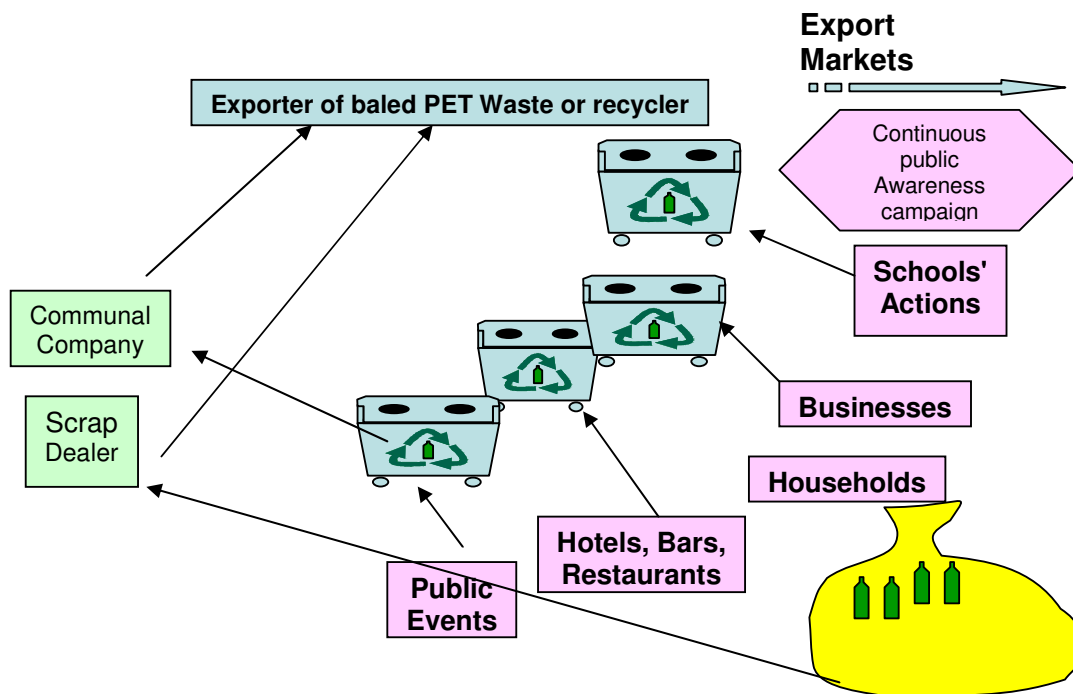
- The positive green image that the bottling companies get associated with the recycling of PET;
- The funds for collection of PET waste will be larger, thus the interest among collectors will be larger.
- In case the law for creating environmental fund has been adopted, the association of generators of PET and PET recycling association should lobby to redirect taxes gathered from the PET generators to recycling programs.

Disadvantages (Issues):

- Creating interest among the PET bottling companies to participate in this fund;
- The problem of precise measuring or identifying the quantities that each member of the association uses in the production;
- The problem with the market participation intelligence information.

### Scenario 3: Municipalities

According to the Solid Waste Management Law which is currently in the phase of finalization before approval by the parliament, the municipalities among other responsibilities are obliged to deliver annual plans and programs for waste management, to deliver acts that will treat the selection, collection and transporting the communal waste, to cooperate with other municipalities in the waste management related issues, to realize projects and investment activities for the improvement of the overall situation in the waste management.



With the current process of transferring more of the responsibilities and the authority

from the central government to the municipalities, the municipalities will have higher power to do more about the treatment of the PET waste.

In addition, the Ministry of Environment and Physical Planning in cooperation with the REC initiated an implementation of Local Environmental Action Plans in 5 municipalities (PEJA, GJILAN, GJAKOVA, and FERIZAJ AND PRIZREN). The objective is to support for the development of Local Environmental Action Plans in five Municipalities in the Republic of Kosovo, as well as their implementation through solution of part of the priority environmental problems in each Municipality. The first findings of the LEAP processes in the five municipalities have ranked waste management as issue number one. The Regional Environmental Center will contribute 40,000 Euros per each municipality in implementing the priorities; on the other hand municipal contribution will be in the amount of 20,000 Euros per municipality. REC director has requested close cooperation with KPEP in case KPEP decides to support plastic recycling in Kosovo. He strongly believes that cooperation can result in successful outcomes.

LEAPs have been active in designing and implementing projects in the area of the environment.

In this scenario, each of the municipalities is in the position to create its own PET collection activity. In this process they could use several scenarios to be developed based on the findings.

## 5. CONCLUSIONS AND RECOMMENDATIONS

Most of the above scenarios are feasible. There are other scenarios possible, which would be a combination of the above as well as include original solutions from the municipalities. The approach in creating efficient formal and informal collection system should follow the logic of bottom up approach including opinions of the stakeholders involved in the process.

**Scenario 1: Scrap dealers:** Possible but time consuming. In situation where there is no recycler in country, the collected quantities would be minimal.

**Scenario 2: Individual collectors + Scrap dealers + PET subsidizing:** Feasible scenario and very realistic, will enable scrap dealers that profits are made on higher traded volumes and not on big profit margins.

**Scenario 3: Municipalities:** The main issue is how well the local authorities are capable of organizing such systems. They should, of course, be obliged to carry out such activities, but there be realized relatively fast.

Which scenario to adopt, would depend on the most interested stakeholder(s).

The key stakeholders for the PET recycling are the following:

**Ministry of Environment and Spatial Planning:** Relatively recently established, the role of this ministry is to provide for the possibility to develop a system of environmental management by an adequate institutional capacity and appropriate legislative framework.

Among other responsibilities, this Ministry is cooperating with civil society associations, civil initiatives and other forms of civil activity and is involved in inspection supervision within its scope of activity. The Ministry is also responsible for issuing licenses for import, transport and export of waste as well as draft laws and regulations concerning waste management and management of packaging waste.

The draft law on creating environmental fund creates necessary background to establish efficient recycling in the country

**Municipalities:** The authority and the responsibility of the municipalities will be increased with the new law on managing landfills. The areas covered include: planning and leading the local economic development; planning and regulation of the municipality territory; organization and managing the communal infrastructure; protection of the environment and nature.

**Communal companies:** With the approximation of the Kosovo legislation to the legislation of the European Union, and especially in the area of primary selection of communal waste, the communal companies have to plan reorganization of their operations to comply with the directive on packaging and packaging waste.

**Landfill companies:** The primary and secondary selection and recycling are critical for the landfill companies, since reducing the volume of deposited waste in the landfills increases the period of duration of the landfills. Being large investments, any activity in this regard would be beneficial and should be supported.

**PET bottling companies:** The concept called "producer responsibility" is widely accepted in many countries in the world. In numerous countries abroad producer responsibility for the waste generated by products and packaging is mandatory. All bottling companies have the moral obligation to do something about the PET recycling. Economy of scale with recycled PET bottles plastic can be achieved by urging soda producers to take their responsibilities for balancing the environmental issues (% recycled).

Furthermore, with almost 50% of all consumer beverages in Europe and the USA being sold in PET bottles, and annual world growth rates regularly reaching two figures, it has become clear that the classic market for recycled PET (textile fibers, strapping, automobile moldings etc) will not be big enough to absorb all of this post-consumer material. The growth in PET beverage containers is itself also on the verge of requiring a regular and reliable supply of recycled material simply to meet demand.

**Recycling companies:** By the nature of their business, recycling companies are interested in the collection of PET bottles as raw materials for their production process.

**Scrap dealers:** Like the recyclers, by the nature of their business, scrap dealers are involved in the dealing with secondary materials. Including PET in their business would create additional income.

**Tourist and other business associations:** One of the factors for attracting tourists to Kosovo is a clean country.

**Citizens of Kosovo:** The wellbeing of this and next generations depends on the actions we take today.

## II. Kosovo Plastic Recycling Feasibility Study

### A. OPERATIVE FEASIBILITY STUDY

#### SUMMARY

Properly designed PET plastic recycling collection programs greatly increase the quantity and quality of PET collected, and can reduce overall recycling system costs.

To maximize recovery and value of PET plastic containers in a community's recycling collection program, as well as supporting individual informal collectors, two best practices should be followed in the program design.

**The first** is to establish an effective plastic recovery through informal collection. The informal sector in solid waste in Kosovo consists of micro and small enterprises and individual and family enterprises that are primarily of marginalized groups from the ghetto (mahala). As is the case with solid waste informal sector in Macedonia, many of them are internal migrants and the effects of the economic transition have created or intensified economic hardship and poverty. At the same time, almost the entire recycling supply chain depends on the activities of these collectors.

**The second** is to establish formal Municipal Plastic Collection Program in two pilot municipalities supported with an ongoing consumer education program.

Studies by the American Plastics Council indicate that participation in local recycling programs can increase 10% to 20% immediately following educational and promotional campaigns. However, it has also been shown that participation will decline unless the educational and promotional efforts are maintained.

The content and design of consumer education programs can greatly impact both the quality and the quantity of PET plastics collected, resulting in a more cost-effective recovery program. The improved quality that results from properly designed and implemented consumer education programs ensures that the PET plastics that the program collects yield the highest market value for the community and can be recycled into new products that conserve natural resources.

Macedonian experience of recycling collection programs around Macedonia consistently demonstrate that the more public education provided, the better the recycling collection program in terms of increasing the quantity of materials collected for recovery and reducing program costs. In addition, through effective consumer education, major sources of potential contaminants can be eliminated from the PET recycling process at the outset. This can greatly reduce the costs associated with sorting, removal and disposal of contaminants at recycling facilities that process PET plastic. This reduces the total cost of recycling post-consumer PET plastic bottles and containers back into new products, making it more competitive with raw materials made from virgin natural resources.

Finally, effective public education programs emphasize the importance to consumers of purchasing products made from recycled post-consumer materials as the most important element to ensuring the long-term demand and economic infrastructure for the recovery of post-consumer PET plastic collected through their local programs.

Identifying the most important key players and starting with pilot project is the approach accepted in this study.

#### 1. Ultimate goal

The ultimate goal is: Growing sustainable plastic recycling business in Kosovo

### Why Growing Sustainable Business in Kosovo

- Underdeveloped or disorganized supply chain to enable higher value adding investment
- Marginalized populations within the informal sector awaiting better prices to boost recovery of plastic
- World Market Prices of Plastic waste predicted to increase
- Possibility to attract investment (Domestic and foreign)

### A significant business opportunity exists in the Kosovo Plastic recycling industry

- What a modern landfill is, or what it costs, there was little (demonstrated) understanding of the related sitting issues with local and national authorities, capital costs, technology, environmental protection, tipping fees, hauling distances, or the issues of weighing the waste.
- The current landfills are approaching the end of their lifecycles, while other landfills have not been planned to be constructed.
- Kosovo has limited land to be used for new landfills
- Waste management has been proclaimed by the government to be issue number one.
- Regional Environmental Center (REC) – Office in Kosovo initiated the implementation of the Local Environmental Action Plan (LEAP) project, a strategic action that provides solutions for the municipal environmental problems. LEAP is a participatory process for a regional or local community that leads to concentrate environmental investments. REC chosen five Municipalities for implementation of LEAP project: Ferizaj/Uroševac, Gjakovë/Đakovica, Gjiilan/Gnjilane, Klinë/Klina and Pejë/Peć. In order to figure out the priority areas the citizens of selected municipalities face, REC conducted a survey distributing questionnaires to almost 5000 households per each Municipality. The households were asked for the environmental issues that they considered being the most problematic. Five municipalities have ranked waste management (relatively poor waste management system, characterized by poor data records and lack of collection and disposal equipment) as the most problematic issue. REC will finance 40 000 Euros per each Municipality, and the Municipality will co-finance additional 20 000 Euros for the implementation of one of the priorities. REC will not enforce the Municipality to implement the most ranked issues (in this case the waste management) but will let the Municipality decide which of the issues they want to implement. So far, Gjakovë/Đakovica and Klinë/Klina have accepted the REC program and have decided that the investment should be made on greenery, i.e. parks, even though the waste management was ranked the most problematic, municipalities chose something that is easier for implementation. Pejë/Peć, Ferizaj/Uroševac and Gjiilan/Gnjilane have not accepted the REC programme yet, waiting after the local election takes place.
- Municipality of Pristina is waiting for approval of a project applied with the European Commission to address ISWM (Integrated Solid Waste Management), the centerpiece of this project is to establish a program on public awareness with specific focus on recycling of waste
- The payment of landfill fees is in its infancy. This means that avoided costs of land filling are not any kind of a factor in motivating prevention, recycling, volume reduction, or related activities
- Opportunity remains largely untapped with low recovery rates



- Current situation in Kosovo(Recovery rates, less than 5% for PET)
- Best Practice, Emerging market Macedonia (PET Recovery rate over 50%)
- Formal recycling existed few years ago in Pristina Municipality and as told by officials, Pristina inhabitants responded to the established infrastructure for at source separation. However the citizens stopped with at source separation of the waste as soon as they realized that PUC was gathering all types of garbage with the same vehicle.
- The motivation of national and local officials appears to be volume reduction first and income generation second.

**2 Value chain analyses**

I. Weakness across the supply chain

	Source separation	Individual collectors	Collection centers	Recycler
Who's involved	Household/ Industrial/ Commercial	(Marginalized Groups) Predominantly Roma and other poor	Scrap dealers, SME's	Kroni, and small scale HDPE and LDPE recycling companies
Challenges	No containers / no transportation equipment/ no separation / Low awareness	No equipment, insufficient information, Low price of PET waste offered by collection centers	Insufficient Number, Poorly located, Limited Scale, Low PET buying price, Limited Equipment, Limited scale	Lack technical and business knowledge/Lack working capital/ quality feedstock and equipment as well as space to create end products
Outcomes	No recovery rate	Limited capacity/ low value capture	Weak economic viability	Investment not sustainable in this part of chain on PET Bottles

Limited competition downstream of individual collectors

	Source separation	Individual collectors	Collection centers	Recycler
Competition As –IS		No competition at all (Non existing price)	Geographic monopoly (Price information asymmetry)	Limited number of players(The only recycling company encounters technological, financial and administrative problems)

Ways to drive additional competition		Subsidizing of collection in order to boost recovery of PET and to sustain the process through the volume based approach	Create profits through higher recovered volumes of PET	Creating incentives for additional processors to enter market
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The supply chain after KPEP Investment

	Source separation	Individual collectors	Collection centers	Recycler
Improvements	Increased separation(Establish Municipal Plastic Program)	Better price, Better conditions, better organization	Scrap collectors, Sme's	Kroni( Asses the technical issues Kroni is facing, test quality of PET Flake produced, and check availability of working capital) In the second phase of project assess the needs and assist small scale HDPE and LDPE recycling companies
Outcomes	Initiate recovery, Improved quality, Higher recovery rates	Increased collection, increased profits	Functioning network to supply recycling companies, Sustainable profits, Consistent demand for Recyclables	Increased productivity of existing recyclers, Potential for large investment in PET Recycling.

Keys to recycling success:

**Commitment** - Support from lead organizations, institutions and business, such as a policy statement, memo, funding, or direct involvement.

**Collection** - An efficient, easy-to-use, consistent, and prominent collection system.

**Public education** – Continuous public awareness

**Participation** - Employees and attendees who are aware and supportive of recycling efforts.

**Markets** – Developing new markets based on solid buyer-costumer relationship

### 3. Key issues

Kosovo Plastic Recycling in its short history faces more problems than the system could cope with. In hindsight, its failure is inevitable if support fails. Problems included:

- Lack of continuous sustainable collection due to PET price variations
- Inability to achieve the quoted throughputs from the machines installed
- Lack of understanding of the collection centers that higher collected volumes enable profitability and not higher profit margins.
- Lack of understanding that foreign higher value added buyers are interested only in continuous and confirmed volumes of supply
- Lack of understanding that the buyers (recycling companies abroad) have yearly planning of their production and the fact that they can not rely on non verified partnerships.
- Current Kosovo recovery and processing of PET serves Macedonian recycling companies only as an unreliable source of raw material. And supply from Kosovo is continuous with limited volumes and constant change of the partners (Suppliers).
- Macedonian recyclers due to encountered problems in seller-buyer relationship pay 15% to 20% less to Kosovo suppliers compared to Macedonian suppliers.
- Difficulty of manufacturing products due to poor know how
- No foreign direct investment in the recycling industry
- Difficulty of manufacturing products due to poor supplies
- Poor price in the first half of 2009 and lack of markets for manufactured PET granulate and PET flake
- Difficulties in quality control of production of PET flakes

Essential aspects for the Plastic PET recycling in Kosovo are:

- Primary key stakeholders
- Necessary Equipment
- Required Financing
- Continuous promotional activities and public education

In lack of Kosovo Waste management Strategy, municipal waste management plans and programs as well as lack of the latest law on waste management approximated to the EU standards (to be delivered later in 2009 with focus on Polluter pays principle) and no PET recycling in the country, the primary stakeholders are identified as follows:

- Recycling company (-is)
- Municipalities
- Communal companies
- Informal collectors
- Scrap dealers

- Regional waste transfer stations
- Landfill operations

The key for attracting foreign direct investment in recycling industry in Kosovo as well as create solid background to support current domestic initiatives and investments in the recycling industry, is securing the necessary quantities of PET waste.

The responsibility for the collection of the communal waste is on the communal companies. The majority of PET bottles currently end up in the landfills.

The necessary equipment for establishing formal collections is identified in containers, bailing presses and sorting line. However informal collection can boost the recycling industry in the short run as a result achieving sustainable volumes of recovered PET on the long run.

The profitability of PET recycling is inextricably bound up with the price of virgin PET. Only when (part of) the collection costs are paid for by the municipalities combined with virgin prices at a level of around 1000 euro per ton, the profitability of PET recycling might become sufficient to guarantee a stronger financial position for the PET recycling chain. The current price of virgin PET is 1600 Euro per tone

#### **4. Immediate activities (six months)**

The immediate activities would cover:

- Identify collection centers and individual collectors for establishing continuous and sustainable recovery of Plastic
- Assess the technical issues the recycling company is facing
- Test the quality of the PET flake Produced by the Recycler (Kroni)
- Evaluate the financial capacity (working capital) of the recycling company to start with collection of PET waste
- In case the recycler (Kroni) fails to secure the necessary working capital while the technical issues have been resolved and PET flake tests to be good quality, encourage and support the recycling company and collection centers to establish partnership based on commercial background to continue with processing of PET Flake
- Initiate and Establish Plastic recycling association aiming to, finding ways to increase recycling levels and overcome technical and economic barriers to growth.

Through a strong membership base and industry links, the association should provide a range of services for everyone concerned with plastic bottle recycling – from prices, market approach, packaging waste legislation to education packs for schools, to helping local authorities and waste management companies develop excellent plastic bottles recycling programmers.

- Design a pilot project in at least two municipalities with PET containers placed for primary selection;
- Secure financing for the two municipalities;
- Require at least 50% of co-financing by municipalities
- Locate recycling bins next to all garbage bins to encourage people to recycle when they are disposing of their beverage bottles.
- Recycling bins located away from garbage cans may be mistakenly used as trash bins.

- Municipal Plastic collection Program in the Pilot Municipalities should create Private Public Partnership between Pilot Municipalities and collection centers, recyclers in buying and processing of the collected materials.
- Evaluate the possibility to establish waste sorting facilities in the two Pilot Municipalities, aiming at recovering recyclable waste to generate income from the sale of recyclables as well as reducing volumes of waste aiming to save on transportation land filling costs.
- Public campaign for the two municipalities involving children from primary education as key players in raising public awareness;
- Follow up on the success of primary selection;
- Establish communication with the ministry of environment to address the legal background for establishing effective recycling.
- Involve other stakeholders:  
Other organizations and business associations (such as Tourism association, Association of Municipalities of Kosovo, NGO active in the field of environment);  
Open dialog with waste generators – water and soft drink producers (participation for the damage);
- Searching for financial matching with other organizations (Primarily REC, GTZ, Mercy corps, SNV, UNDP,
- Initiate public campaign and education on national level (Prepare and plan for organization of a national public awareness event).

**Secure financing for recovery of PET, recovery equipment, and processing equipment presses as well as possible operations to take place in the transfer stations and landfills;**

1. Initiate collection of PET waste through providing subsidize to individual collectors, the subsidize should be paid per KG of collected PET waste and should not be more than 0,035 Euro Cents.
2. Co-finance the assessment of technical issues encountered by the recycler
3. Enable testing of the quality of PET Flake produced by the recycler
4. Co-finance the formal collection of PET waste through establishing Municipal PET collection Program.
5. Co-finance processing equipment for companies providing evidence of collected PET waste.
6. Support the waste transfer station operations to separate PET bottles and other recyclable materials in one of the pilot municipalities, bale them and sell to the recycler(or export)
7. Support the development and implementation of the public campaign on local level(Pilot municipalities) and national level;
8. Assess the micro –finance institutions to improve access to finance for entities in the value chain

**5. Activities to follow (one year)**

Activities to follow up would include:

- Continue to assist building the PET recycling association aiming at attracting higher value recycler;
- Support the collection centers in understanding the legal and regulatory environment and their obligation to get licensed
- Establish partnership relationship with the Ministry of Environment with focus on implementing the polluter pays principle.
- Lobby with the ministry of environment to utilize taxes collected from PET generators same to be reinvested in recycling programs (to continue with financing of Municipal Plastic collection programs)
- Assist ministry of environment to implement the EU directive on packaging and packaging waste
- Further establish Municipal Plastic PET collection Programs in additional 2 municipalities.
- Secure financing for the additional two municipalities;
- Public campaign for the two municipalities;
- Execute the national public awareness event
- Follow up on the success of primary selection;
- Continue to involve other stakeholders and enhance the cooperation with the existing stakeholders:
  - a. Other organizations and business associations (such as Tourism association, chamber of commerce, association of municipalities, civil society);
  - b. Open dialog with waste generators - soft drink producers (participation for the damage);
- Searching for financial matching with other organizations
- Mobilize Micro-finance organizations to improve access to individual collectors, collection centers, recyclers.
- Provide technical assistance to individual informal collectors to support their sustainable economic development and poverty reduction.
- Continuous public campaign and education.

## **6. Mid-term activities (three years)**

- Transfer the experience of primary selection to other municipalities;
- Evaluate the results of the previous two phases and plan accordingly for the mid term period
- Set target for the PET recycling at 50%;
- Develop program to assist recycling chain players based on needs assessment
- Continuous public campaign and education;
- Start primary selection (Municipal Plastic collection Program) in additional 10 municipalities;
- Continue to actively be part of the legal assistance to ministry of environment in drafting the legislation incorporating EU directives on packaging and packaging waste;
- Continuous public campaign and education on national and local level

- The higher volumes of collected PET volumes will enable new higher value recyclers in Kosovo, work closely with potential investors to point out the benefits and the enabling environment created in the previous two phases.

### **7. Catalysts of the process**

The PET recycling has been initiated and greatly supported by the USAID. However, without further support and nursing the process from sources like: REC, GTZ, UNDP, European Bodies, International Environmental organizations and other interested parties it would take too long for the achievement of the Ultimate Goal.

## **B. Financial feasibility study**

### **1. SUMMARY**

There are three stages of product's life cycle:

- Extraction / manufacturing
- Use
- Waste management

The world experience has shown that:

- virgin-content production uses more energy than recycled-content production;
- virgin-content production creates more pollution than recycled-content production;
- additional energy use and pollution from curbside recycling trucks are overshadowed by conservation of energy and reduced pollution from recycled-content production;
- reasonable estimates for the costs of pollution indicate that recycling actually costs less than garbage.

The cost-benefit of the PET recycling should be viewed through: • environmental impact:

- impact on the landfill operations;
- impact on the transport of waste;
- social impact:
- employment of additional people;
- image of clean country and benefits that follow;
- economic impact:
- employment of additional people;
- income generated from the sale of PET waste

### **2. FINANCIAL ASPECTS**

Identifying the most important key players and starting with pilot project is the approach accepted in this study.

#### **2.1. Initial capital investments**

Individual collectors and scrap dealers Recycler:

Baling Equipment: \$ 9,000 US  
Building + infrastructure: \$ 10,000 US  
Working capital: \$ 10,000 US

Transfer stations and Landfills:

Baling equipment: \$ 9,000 US  
Infrastructure: \$ 10,000 US



Communal companies / two pilot Municipalities:

PET containers: 70 x \$350 = \$ 24,500 US

PET trucks: \$ 20,000 US

## **2.2. Waste PET Capacities**

### **2.3. Waste PET Prices**

<b>Bottle capacity</b>	<b>1/2 liter</b>	<b>1.5 liter</b>	<b>2 liters</b>
Volumes (dm <sup>3</sup> )	0.5	1.5	2
Weights (kg)	0.03	0.046	0.06
Bottles/kg	33.3	21.7	16.7
Bottles/ton	33,333	21,739	16,667
Bottles/m <sup>3</sup>	2000	667	500
kg/m <sup>3</sup>	60	31	30
Bottles/PET bin	2200	733	550
Kg/bin of 1.1m <sup>3</sup>	66	34	33

PET Bottles (post consume) un-sorted by color and baled US\$ 250-300 / ton; PET Bottles (post consume) sorted by color and baled US\$ 400-450 / ton; PET Bottles (pre consume) sorted by color and baled US\$ 460 / ton; PET Pre-forms sorted by color US\$ 460 / ton

## **2.4. Cost-benefit landfills**

Kosovo has 7 landfills with the largest being landfill in Pristina. All 7 landfills were designed and constructed to fulfill certain criteria, however mismanagement in the landfills has shortened their lifecycle.

With population of about 800,000 people in Pristina and surrounding municipalities, the annual disposal of PET bottles is estimated at 4,000 tons, or 33,334 m<sup>3</sup>. Provided that the bottles are somewhat pressed in the regular waste disposal, and accepting conservatively a compression ratio of 1:2, than the annual disposal of PET bottles at the landfills is 33,000 cubic meters, which corresponds to a compressed mass of bottles placed on a soccer playground and 3.30 m high. This amount represents a relatively small percent in weight of the communal waste (5%), however, much larger percent in volume (about 15%). The communal waste generated in Pristina landfill is about 80,000 tons or approximately 260,000 cubic meters.

Solving the issue of PET recycling, and reducing the PET that ends in the landfills, would increase the lifetime of the landfills for 5 to 10 years.

## **2.5. Social benefits**

The PET recycling would require employment of additional people:

- at the municipality for the establishment of the primary selection
- at the landfills and transfer stations for the secondary selection;
- at the recycling plant for the processing.

PET recycling is a good jump-start project for improved primary and secondary selection and recycling of other recyclable materials (paper, aluminum, glass, and other plastics). Supported with pragmatic public campaign, the process would provide for cleaner environment, thus it would improve the conditions necessary for other income generating activities for the country, such as tourism, agriculture etc.

### 2.6. Benefits from export of baled waste PET

<b>Scrap dealer calculation:</b>				
<b>Raw materials</b>	<b>Euros/kg</b>	<b>Euros/ton</b>	<b>\$/kg</b>	<b>\$/ton</b>
PET bottles buyout (individual collectors)	0,10	100.00	\$0.14	\$140.00
Baling and sorting and labor	0,012	12,00	\$0,0017	\$17,00
Transport to recycling company in Macedonia	0,020	20.00	\$0.028	\$28.00
<b>Total</b>	<b>0,17</b>	<b>170.00</b>	<b>\$0.186</b>	<b>\$186.00</b>
Selling price(sorted and baled PET waste)			0,26	260
Net profit			0,074	74

### 2.7. Profit analysis for the recycler

In addition to the extending the life of the landfills, income will be generated for the people involved through the sale of waste PET to the recycler or to the exporter.

The profit analysis for the recycler covers analysis of the variable and fixed cost.

<b>Processors calculation (Kroni):</b>	
<b>Raw materials</b>	

	Euros/kg	Euros/ton	\$/kg	\$/ton
PET bottles buyout (baled)	0,15	150.00	\$0.21	\$210.00
Local transport	0,020	20.00	\$0.028	\$28.00
<b>Total</b>	<b>0,17</b>	<b>170.00</b>	<b>\$0.238</b>	<b>\$238.86</b>
<b>Processing (variable costs) - 300 kg/hour capacity</b>				
<b>Expected 100 tons/month</b>				
	Euro/kg	Euro/ton	\$/kg	\$/ton
Electricity + heating (300 kW)	0,092	92.00	\$0.135	\$135.00
Water (300 l /hour) =				
(0,3m3/hour)	0.0010	1,00	\$0.0014	\$1.14
Packaging			\$0.010	\$10.00
Other			\$0.010	\$10.00
<b>Total</b>			<b>\$0.156</b>	<b>\$156,14</b>
<b>Processor's (fixed costs) - monthly</b>				
Labor	0,040	40,00	0,056,00	\$5,600
Administration				\$3,160
Maintenance + spare parts				\$4,000
Depreciation (7.5 years)				\$5,000
Communications				\$2,000
Marketing, transport etc.				\$2,500
Other				\$3,000
<b>Total</b>				<b>\$25,260</b>
Total fixed cost monthly / ton (@ 100 tons/month)				\$252,
Total costs (\$/ton)				\$647,00
<b>Selling price September (\$/ton)</b>				<b>Min \$850.00</b>

### 3. CONCLUSIONS AND RECOMMENDATIONS

The solution to PET recycling problem requires appropriate laws, innovative thinking, financing and above all leaders equipped with courage and persistency.

## CONCLUSIONS AND RECOMMENDATIONS

Throughout the assessment of the Kosovo Plastic recycling industry we learn that Kosovo has an excellent opportunity to develop plastic recycling activity, at the same time we learn that this is a demanding activity. During the assessment phase we learned more about the seriousness of the plastic recycling issue on local and national level, met some of the probable key players in the plastic recycling business and potentially created a certain level of hope that could move Kosovo closer to the implementation of a sustainable recycling activity.

The results of the assessment of the Kosovo Plastic Recycling Industry are the following:

- Finished the research activity and prepared reports containing valuable information and conclusions that would be crucial for the recycling project;
- Assessed companies in the plastic recycling sector;
- Initiated interest between the various groups to participate in possible Plastic Recycling activity (processors, scrap dealers, public communal companies, and donors).

The idea about recycling of plastics was welcomed and in general supported by all interviewed entities. Almost all the companies and other entities expressed willingness in taking part in the next steps of this project.

Based on the numbers and the application it is evident that two types of plastics are most "eligible" for organized approach in the collection, sorting and recycling. These are the polyethylene (PE) and the polyethylene terephthalate (PET).

### **Conclusions:**

The continuance of this activity in the second phase should focus on the post consumer recycling.

For the recycling of polyethylene, polypropylene, PVC and polystyrene there is already sufficient capacity installed. The problem for these recyclers is quality and quantity of materials collected.

The recycling of PET is almost non-existent. Few attempts in the past (2008) Paja and Metal Elektro from Ferizaj) to export collected and baled PET bottles were on occasional basis. The attempts of Paja from Ferizaj in 2009, and Tiki Niti from Ferizaj are based on enthusiastic approach and tackle only the region around Ferizaj, concentrating on PET waste collected from KFor Basis (Bondsteel Ferizaj) and production waste from water bottling companies.

The activities of scrap dealers are focused on collecting materials for which there is a good market (metal and paper). They are interested in collecting plastic provided there is a buyer.

Some Scrap Dealers has been trying to establish communication with the public communal companies to "extract" (utilize) the garbage from the disposal locations. They succeeded in persuading the public communal company in Ferizaj and Gjakova to allow them to use the disposal site for the collection and sorting of various types of waste.

**Recommendations:**

The main goal of the possible Kosovo Plastic Recycling Project is to create interest in collection and recycling of plastic bottles, identify business leaders eager to undertake the recycling process and provide technical assistance and financial support to build the capacity of those leaders.

As collection is the first step in creating viability, MDC TI Net after thorough analysis of the findings recommends subsidizing collection of 500 to 700 tones of PET waste. The subsidize should be limited to 0,047 Cents per Kilogram, totaling 35000 USD.

Critical to the project is the design of a network of collectors and small scale recyclers. A network for metal and paper, organized through private firms, scrap dealers etc. does exist. Based on the assessment of companies in September 2009, all of the 20 companies interviewed showed interest to become part of the PET collection network. Thus the first objective is to initiate PET collection in Kosovo.

**Objective 1: Initiate PET collection in Kosovo (Assist informal collectors)**

Activities: Subsidize collection of 500 to 700 tones of Pet waste (The informal individual collectors should benefit from the subsidize)

Identify scrap dealers to take part in this activity (Prepare application form, develop criteria for subsidizing, develop system to monitor and evaluate the process)

Assist scrap dealers in identifying potential buyers in the region (first approach the Macedonian recyclers and than research European buyers as quantities rise)

Indicators: min 700 tones of PET collected

At last 150 Individual informal collectors commenced with collection of Plastic.

Scrap dealers understand that profit is generated on higher volumes and not on high profit margins.

Scrap dealers and Informal collectors develop stronger relationship based on continuous supply and demand of PET waste.

Scrap dealers enabled access to potential buyers, long term agreements signed between at least two foreign buyers of PET baled waste and two Kosovo scrap dealers.

Stakeholders: Scrap Dealers

Individual Roma collectors

Timeframe: 6 months

Budget for this objective: 35 000 USD

The responsibility for the collection of the communal waste is on the communal companies. The majority of PET bottles currently end up in the landfills.

In support of the decentralization effort, planned Municipal program in two pilot municipalities will build municipal capacity to implement one of their core competencies – waste management, giving them an opportunity to generate additional income from sold plastic bottles as well as reduce land filling cost.

The activity should cooperate with education projects to jointly raise the public awareness for recycling through collection campaigns in schools as well as working with universities to leverage research and development opportunities.

**Objective 2: Initiate Municipal PET collection in Kosovo**

Activities: Develop criteria to select two pilot municipalities (Close cooperation with REC is essential in developing the criteria's)

Visit and assess at least 6 municipalities

Establish selection committee (composed by REC, USAID, Association of Municipalities, Ministry of Environment, association of Public Utility companies)

Select 2 municipalities

Establish PPP in implementing the Municipal Plastic collection Program

Develop municipal PET collection program for each Municipality and Define areas of intervention by REC, Municipalities, USAID and the private partner

Local public awareness campaign targeting primary school students developed

Leverage Local funds at least 50% of the USAID's investment

Develop working relationship with ministry of environment IN IMPLEMENTING THE LAW ON Environmental fund

Indicators: Two pilot municipalities selected

Municipal PET collection program developed, implementation initiated

PET collection infrastructure procured and set

Public awareness campaign implemented at least 25% of the population in the respective municipalities aware of the recycling program implemented in their city

At the end of the first six months, at least 7 tones of plastic collected through the municipal plastic collection program

Cooperation with the ministry of environment established

Codify knowledge gained through the implementation of the Municipal Pet collection program

Stakeholders:

Scrap dealers

Municipalities

Communal companies

Informal collectors

Regional waste transfer stations

Landfill operations

REC

Ministry of Environment

Timeframe: 6 months

USAID Budget for this objective: 50 000 USD

Municipal Contribution: 30 000 USD

REC contribution: 60 000 USD

Private Partner: 30 000 USD

Total Budget fro objective 2: 170 000 USD

Technical assistance to companies should address areas of business development, as most of the companies are very small but with a potential to grow very fast, assistance should primarily focus on developing their business ideas into concrete businesses.

The initial research showed a lack of knowledge of PET characteristics, market, and collection methods. Furthermore, the research showed a lack of adequate equipment, mostly in the area of collection as well as in primary processing (bins, baling, shredding, etc.).

The KPEP should work closely with interested firms and will provide technical and financial support. The technical support will consist of providing assistance in the development of collection networks, business planning and costing.

The creation of it will boost the development of a new recycling industry in Kosovo and contribute toward creating value-added exports, attracting FDI, developing innovation in new product development and improve industry competitiveness through vertical integration.

Furthermore, this activity not only will have a significant impact on making Kosovo compliant with EU environmental requirements, but will also generate economic opportunities for the most disadvantaged groups (mostly Roma) by engaging them in the supply chain.

### **Objective 3: Technical and financial assistance to collection and recycling businesses**

Activities: Identify companies willing to Co-finance processing equipment based on strong evidence of quantities of collected PET waste

Develop application form and criteria for purchasing processing equipment

Identify market leaders with potential to invest in higher value added recycling of PET(domestic and foreign)

Organize one B2B with Macedonian companies and Public entities

Develop training curricula (From Business idea to functional business)

Assess the technical issues the recycling (Kroni) company is facing

Test the quality of the PET flake Produced by the Recycler (Kroni)

Evaluate the financial capacity (working capital) of the recycling company to start with collection of PET waste

### **Indicators:**

- Companies evaluated and selected
- At least one domestic and one foreign investor identified in
- Training workshops conducted for 20 companies
- At least 10 companies participate in the training workshops

- 7 to 10 companies fully developed their business plans
- 7 to 10 companies supported in purchasing PET processing equipment
- At least One B2B organized

Stakeholders: Companies, Macedonian counter partners

USAID Budget: 35 000 USD

Companies co-financing: 35 000 USD

Total budget: 70 000 USD

Timeframe: 6 months

The mission of the PET Recycling Association would be to facilitate PET plastic recycling and promote the usage of PET packaging. Potential members of the Association are, PET collection and recycling companies and PET bottling companies.

#### **Objective 4: Facilitate the founding of a PET Recycling Association**

Activities: Develop grounds for establishing an association of collectors and recyclers

Develop association program and identify potential members

Organize the first assembly of the association

Formally establish the association

Indicator: PET recycling association established

USAID Budget: 4000 USD

Timeframe: 6 months

**Total Budget for Phase one (first six months)**

**Total USAID Budget: 124 000 USD**

**ROI: Up to 700 tones of PET collected and exported**

**Generated 300 000 USD income from export**

**200 new jobs created (informal collectors)**

**10 new employments created with the implementation of the Municipal collection program in two pilot municipalities**

#### **Phase two (one year)**

Activities to follow up would include:

- Continue to assist building the PET recycling association aiming at attracting higher value recycler;
- Support the collection centers in understanding the legal and regulatory environment and the their obligation to get licensed
- Establish partnership relationship with the Ministry of Environment with focus on implementing the polluter pays principle.



- Lobby with the ministry of environment to utilize taxes collected from PET generators same to be reinvested in recycling programs (to continue with financing of Municipal Plastic collection programs)
- Assist ministry of environment to implement the EU directive on packaging and packaging waste
- Further establish Municipal Plastic PET collection Programs in additional 2 municipalities.
- Secure financing for the additional two municipalities;
- Public campaign for the two municipalities;
- Execute the national public awareness event
  
- Follow up on the success of primary selection;
- Continue to involve other stakeholders and enhance the cooperation with the existing stakeholders:
  - a. Other organizations and business associations (such as Tourism association, chamber of commerce, association of municipalities, civil society);
  - b. Open dialog with waste generators - soft drink producers (participation for the damage);
- Searching for financial matching with other organizations
- Mobilize Micro-finance organizations to improve access to individual collectors, collection centers, recyclers.
- Provide technical assistance to individual informal collectors to support their sustainable economic development and poverty reduction.
- Continuous public campaign and education.

**Total USAID Budget for phase II: 200 000 USD**

**ROI: Up to 1500 tones of PET collected and exported**

**Generated 700 000 USD income from export**

**400 new jobs created (informal collectors)**

**20 new employments created with the implementation of the Municipal collection program in two pilot municipalities**

**A higher added value recycler interested to enter Kosovo Market (approx. Investment: 700 000 USD)**

**6. Phase three (three years)**

- Transfer the experience of primary selection to other municipalities;
- Evaluate the results of the previous two phases and plan accordingly the for the mid term period
- Set target for the PET recycling at 50%;
- Develop program to assist recycling chain players based on needs assessment
- Continuous public campaign and education;

- Start primary selection (Municipal Plastic collection Program) in additional 10 municipalities;
- Continue to actively be part of the legal assistance to ministry of environment in drafting the legislation incorporating EU directives on packaging and packaging waste;
- Continuous public campaign and education on national and local level
- The higher volumes of collected PET volumes will enable new higher value recyclers in Kosovo, work closely with potential investors to point out the benefits and the enabling environment created in the previous two phases.

**Total USAID Budget for phase III : 300 000 USD**

**ROI: Up to 4500 tones of PET collected and exported**

**Generated 2 500 000 USD income from export**

**1500 new jobs created (informal collectors)**

**200 new employments created with the implementation of the Municipal collection program in two pilot municipalities**

**A higher added value recycler invested in Kosovo (approx. Investment: 700 000 USD)**

During phase one of this activity, the emphasis is placed on collection and exporting of baled PET. The market mechanics will later show if there is a possibility to further recycle the PET in the country for higher value added products as well as will clearly indicate next steps to be undertaken during phase two and three.

***If USAID Kosovo Private Enterprise Program agrees, the MDC TI Net. will assist in the next phase covering in detail the findings of the assessment phase and converting it into an action plan.***

## ANNEXES

- Annex I. Master List of interviewed companies and stakeholders
- Annex II. Questionnaire
- Annex III. Profile of Companies
- Annex IV. Minutes from meetings

## Annex I: Master List of interviewed companies and stakeholders

### Recycling Companies

Owners name	Location	Company title	Materials recycled	Contact number
Erhan Bula	Obiliq	Plas-Kos	Plastic	044-256-607
Berat Shagiri	Kosovo Valley/Fushë Kosovë	Rec-Kos	Metal/Plastic	044-220-041
Agim Kroni	Blacë-Suharek	NTP"Kroni"	Plastic (PET)	044-797-547
Sedat Jakaj	Ferizaj	NTP"Samira Plast	Plastic	044-121-494
Hazir Aziri	Lipjan	Nuk është ë regjistruar	Plastic	044-751-754
Driton Matoshti	Janjev-Lipjan	Alcom	Plastic	044-316-412
Bajram Tahiri	Ferizaj	NPSH"Mbrotjtja e Ambientit"	Plastic	044-142-179
Blerim Shahini	Ferizaj	Çama Comerc	Plastic	044-797-747
Fadil Dërmogllava	Ferizaj	Metal Elektro	Plastic	044-191-691
Lutfi Salihu	Gjilan	NTSH"Rival"	Plastic	044-132-055
Ismet Murtezi	Gjilan	Rrezi-Com	Plastic	044-688-010
Selvete Gashi	Shtime-Prishtina	Lulebora	Plastic/PET	044-110-970
Astrit Shabani	Podujeva	Plastika SHPK	Plastic	044 115 328
Rexhep Pista	Rahovec	Pista EkoPlast	Plastic	044 113 281
Mehdi Aliu	Ferizaj	Tiki Niti	Plastic	044-121-319
Besim Bici	Prishtina	BICI GROUP	Plastic/PET	049-124-167
Nijazi Ukshini	Viti/Kllokot	PAJA	Plastic	044-133-147
Gykmen Ademagullu	Ferizaj	Gykmen Trade	PET	044-576-927
Bekim Bejtullahu	Podujeve	Euro Plastika	Plastic	044-405-918
Sadri Gashi	Ferizaj	CADI COMMERCE	Plastic (Production of final products)	044-503-635
Murat Dakaj	Mitrovica	Europak	Collection and bailing of PET bottles ad Paper	049-849-792

### Government Institutions

KLMC	Avni Ramadani	manage landfills		Pristina	038/544-551
Kosovo Institution for Environmental Protection	Ilir Morina	environmental policy develop	2004	Pristina	044/504-013
MESP	Shefqet Zeka	government body	2000	Pristina	
WWRO	Afrim Lajqi	license and manage waste management companies	2003	Pristina	044/377 309
Ministry of Environemnt and Spatial Planning	Arben Citaku, Muhamet Malsiu				038/ 517 800

## Non Governmental Organizations

NGO	Name/title of the interviewed person	Scope of activities	Year	Location	Contact information
The Green	Ruzhdi Kuci	collect garbage around public areas	2004	Prizren	044-303-279
REC	Olta Cibuku	manage and distribute public awareness campaigns for waste	2001	Kosove	
Eko-Trepca, Ecological Association	Ramadan Uka	cleaning of the city, awareness campaigns for public	2001	Mitrovica	044-141-410
Life Quality	Nuri Shehu	cleaning of the city, awareness campaigns for public	2006	Ferizaj	044-227-861
Aquila EPA	Adem Nikqi	public awareness campaigns, training for environmental protection, development of environmental strategy	2000	Peja	044-152-354
Eko Vision	Rizah Mucolli	cleaning of the city, awareness campaigns for public	2004	Prishtina	044-417-635
Agency for Rural Cleaning	Adem Lushaj	cleaning of the city, awareness campaigns for public		Decan	044-182-689
Ecolina	Tafe Veselaj	cleaning of the city, awareness campaigns for public		Klina	044-349-780
Environmental Democracy	Bajram Ferati	cleaning of the city, awareness campaigns for public		Prishtina	044-219-695
Kosovo Chamber of Commerce	Hivzi Dragidella	business support services, technical assistance, lobbying		Kosovo	044/169-417
Lulebora	Selvete Gashi			Kosovo	044/110-970

## Donors

Donor	Name/ title of the interviewed person	Type of support	Year of implementation	Contact information
UNDP	Yllka Gerdovci	technical and financial	2000	044-115-942
SIDA	Mirmija Stubla	technical and financial	2000	038-245-795
SOROS	Iliriana Kacaniku	technical and financial	2000	044-610-411
GTZ	Ekrem Hyseni	technical and financial	2000	044-551-272
Care International	Mentor Gjokolli	technical and financial	2000	038-222-435
CDF	Feride Krasniqi	technical and financial	2000	038-249-677
Lux Development	Zana Beqiri	technical and financial	2000	044-799-661
Mercy Corps	Brikena Justina	technical and financial	2000	038-249-987
REC	Zeqir Veselaj	technical and financial		038-225-123
SNV	Haki Kola	technical and financial		038-227 543

## Annex II Questionnaire



## General Information

1. Manager / Owner Name:
2. Contact Number:
3. Address:
4. Name of Business:
<i>Current Activities</i>
5. Type of plastic produced/processed:
6. Do you recycle production waste? If so, what is done with this production waste?
7. Do recycle post consumer waste? If so, what types, and what is done with this material?
8. Sources of raw material:
9. How do you acquire these sources? Do you obtain material from certain scrap collectors?
10. Price Paid per kilo:
<i>Company Information</i>
11. Ownership structure: (sole-proprietorship, partnership, etc)
12. Average annual turnover
13. Company History: In operation since?
14. Investments made (in equipment, name and purpose)
15. Number of employees?
16. Processing/production capacity per month:
17. Expected growth for 2010 (compared to 2008-2009):
<i>Business Vision</i>
18. Business development plans (investments, training, etc.)
19. Do you plan to expand your business? If yes explain:

20. Do you plan to finance growth/development of your business from own resources or intend to acquire capital?
21. Have you ever applied for commercial or microfinance loans? If yes, what was the purpose of the loan?
22. Have you ever benefited from any business development schemes, or have been awarded grants to upgrade your business? If yes, explain what kind of support and was this support helpful?
23. What are some of the major obstacles you encounter in day-to-day operations?
24. What kind assistance/support would your business need in order to grow more rapidly?
25. What/who is the competition in your line of business?
26. Is your business sustainable and are there any threats that could jeopardize its existence?

## Annex III: Profile of Companies

### General Information

Owner Name: Hazir Aziri

Contact Number: 044-751-754

Address: Janjeve-Lipjan

Business Name: It is not registered

### Current Activities

Mr. Aziri has a tremendous amount of experience in recycling because he worked at a recycling company in Croatia. His company is not registered with the proper authorities yet he collects PVC and PP. He only collects and bales the material for sale.

Collection is done by individual collectors and approximately 70 percent is collected by him. He purchases the material for 0.25 cents and sells it for 0.55 cents. He sells his material to other Kosovo company who prepare the material for export to Macedonia.

### Company Background

Mr. Aziri does plan to register his business soon. He has been operating since 2003. He currently employs two individuals fulltime and contracts two other based on the need. His capacity is 8 tons per month and he has estimated his annual turnover at 24.000€.

His investments include grinder, motor vehicle and shredder totaling 25.000€. He expects sales in the future to increase by 20%.

### Business Vision

Mr. Aziri is currently seeking to increase his business to include production capabilities. He is considering the production of children's toys. This would require an investment of 10,000. He is currently seeking donations or a partner for joint funding. Up until he has acquired personal loans from Procredit Bank.

Electricity is the biggest problem for Mr. Aziri's business and the lack of institutional support.



**General Information**

**Owner Name:** Blerim Shahini

**Contact Number:** 044/790-747

**Address:** Rr."Driton Islami"-Ferizaj

**Business Name:** Çama Komerc

**Current Activities**

Momentarily this company collects HDPE and PET. This company does not engage in processing or recycling material. The material collected is baled and sold to other companies in Kosovo. The post consumer material collected primarily comes from the region of Ferizaj.

Price paid for material (upon collection) is 0.25 center per kilogram and it is sold for 0.35 cent per kilogram.

**Company Information**

This company has been active since 1995 but has entered the plastic collection industry in 2000. The only investment made by CAMA was for the shredder machine. There are 2 fulltime employees, and occasionally they engage more employees as needed.

Collection capacity is currently at 15 tons per month for both PET and HDPE. The owner is skeptic that the business will have growth in 2010.

**Business Vision**

This company focuses more on the scrap metal collection system rather the plastic collection. Regardless they plan to continue to collect plastic but would consider other options within this industry with some technical and financial assistance.

For the plastic collection sector of this business, this company has a lack of operational capital and training for employees.

**General Information****Owner Name:** Rexhep Pista**Contact:** 044-113-281**Address:** Rahovec**Business Name:** Pista Ekoplast**Current Activities**

As one of the largest recycling companies in Kosovo, Ekoplast was privatized in 2004. This company collects, classifies, recycles and produces final product for Kosovo, Serbia and Albania. This company collects a wide variety of plastics, LDPE, HDPE, PP, PVC, and PS. They have tried to recycle PET but were unsuccessful because of the low price for collectors and were not able to secure material. The owner said that it is difficult to collect and recycle PET because of its very low price for collectors.

This company is supplied with post consumer waste by Kosovo's supermarkets such as ETC, Ben-Ad, and MAXI, as well as other supermarkets in Kosovo which are located in Pristina, Prizren, Pejë/Peć and Gjilan/Gnjilane. The companies purchases the material for 0.15- 0.20 cents per kilogram.

Final products include plastic pipes for electrical installations, electric sockets, and crates for flowers, water pipes, and water hoses.

**Company Background**

This company was privatized in 2004 and currently possesses the capacity of 1600 tons per year or approximately 133 tons per month. The number of fulltime staff changes on occasion, but the company does not employ less than 8 people at any given time. This company has invested a tremendous amount of money since 2004 but was not able to declare how much. However, the complete recycling line they have purchased is not new technology.

As mentioned before, the company exports products to Serbia and Albania, as well as within Kosovo. According to the owner, in order for the company to see an increase in profits, fiscal policies and institutional support for the recycling industry. He recommends that they be offered partnerships and government subsidies.

**Business Vision**

This company plans on increasing capacities and would like to acquire new technology. At this point they are seeking to acquire new equipment on certain points of their process/production line. This is expected to be costly and therefore the owner is seeking grants, donations or other funds.

This company has never been a beneficiary of a grant or donation. The problems the company faces is lack of strong and stable energy supply, lack of institutional support, and lack of new technology. According to the owner, this company is in need of a strong organization to lobby the institutions to gain more support for the recycling industry because "this is the only sector that exports". The owner is interested in establishing an Association of Kosovo Plastic Recyclers.

**General Information**

Owner Name: Driton Matoshi

Contact Nr: 044-316-412

Address: Lipjan

Business Name: ALCOM

**Current Activities**

The main activity of ALCOM Company is to collect and sell products in Kosovo's market. This company collects two kinds of plastics: PET and HDPE. The collection is done by individual collectors, businesses and KFOR Bases in the region of Lipjan. The company doesn't have formal agreement with individual collectors for permanent supply. The biggest plastic suppliers for ALCOM are KFOR Bases and different businesses.

The cost of purchasing PET and other types of plastic is 0.20 cents whereas they are sold for 0.30 cents, it is important to mention that the company still hasn't found a favorable market to sell PET plastics.

**Company Background**

The company was found in 2004 as individual business and since then has collected metal, plastic, nylon and paper. Collection capacity of HDPE is 8 tons and PET is 3 tons. Company's annual circulation is 25000-30000€. This company has 4 full time employees.

Regarding, whether they expect business growth in 2010 compared to 2008 – 2009, the owner of the company has indicated they expect an increase of 30%. So far the company hasn't made any investment in the plastic sector, because it has not been their priority.

**Business Vision**

The company is planning on increasing efficient collection and sale of metals and other products aiming to earn higher profits. For this reason the company, intends to pay more attention to the plastic sector, buying shredders, plastic grinder, which investments cost up to 10.000€. Investments made so far capture the value of 50.000€, the money was provided by commercial banks. So far the company has not received any donation in monetary or technical form. According to the company the problems they are challenged with are as follows:

1. Lack of subsidies
2. Lack of job equipments
3. Lack of strategy for recycling
4. Lack of electricity

**General Information**

Name: Selvete Gashi

Contact Number: 044/110-970

Adress:Shtime-Prishtinë

Business Name: NGO "Lulebora"

**Current Activities**

Nongovernmental Organization "Lulebora" currently is involved in the activity of collection and selling various kinds of plastics. The most collected plastic from this organization is: PET and HDPE.

The collection of these plastics is done through a combined method, meaning that a part of the plastic is collected by individual collectors who bring the plastic in the storage area and another part is collected from other collection points in Kosovo. The collection is made also in private businesses, especially it is more obvious the collection of PET in the KFOR camps.

The accumulation of plastic material is done only through the cast of household waste, businesses and KFOR, which means that no part of the material collected comes directly from the remains of product production.

Gathering of these plastic materials is done by all centers of Kosovo, using the collection points that are built in the following centers: Drenas, Skenderaj, Novoberd, Vushtri and Shtime. These centers are built from a European Commission donation.

Although, PET prices have fallen, their collection still continues, even if in a smaller capacity. Last year, in general plastic prices were 0.10 cents purchase price and 0.20 sale price whereas, this year purchase price is 0.05cent and sales price is 0.11-0.13 cents. All the collected plastic is sold in Kosovo's market.

**Company Background**

Nongovernmental Organization "Lulebora" was established in 2001, as an opportunity to engage men and women in the work process. Viewing the difficult situation and high unemployment level, the organization has developed a project for collection and sale of plastic in the Kosovo market. During that time the organization has earned a donation in the amount of 38,00€ by the European Commission, and bought the following: Shredders for PET, HDPE grinder, mixer to grind the nylon, granule machine and 6 electronic scales for measuring. Also part of this project was the construction of collection points in the cities mentioned above.

This organization currently has employed 5 full-time employees while at the collection points 7 other employees are engaged.

Sales	275.28
Sales Discounts	
Sales in Order (processed nylon and hard plastic)	15,243.90
Net Sales	15,843.90

Regarding the trend of increase collection activity, Mrs. Gashi declared “I think 2010 will be much more profitable than 2008-2009, considering that we have a price rise of plastic and in this way there is a bigger interest of plastic collection.”

**Business Vision**

Lulebora’s vision is to build capacity collection and increase the number of workers. The organization intends to achieve this by cooperating with relevant stakeholders as: Municipal Assemblies, Businesses, Households and NGOs, on the purpose of building a classification system and regular collection of PET. The organization claims that by conducting awareness campaigns, citizens themselves can classify PET and then the organization can easier do the collection of PET from households. Increase of collection activity is seen as an immediate need considering the large quantity of thrown PET.

As regards to the problems that the organization is faced every day, Ms. Selvete emphasizes “We face lack of space to accommodate working needs. In Shtime we have a rental location, but that doesn’t meet our needs.”

Organizations assistance needs are: Ensuring a proper work facility and buying a truck that would compact the plastic within the truck.

**General Information**

Name: Sedat Jakaj

Contact Number: 044/121/494

Address: Rr.Vezir Jashari, Ferizaj

Business Name: NP."Samira Plast"

**Current Activities**

The company Samira Plast collects, cleans and bales PP, HDPE, and LDPE. According to the owner, he exports this material outside of Kosovo because there is no company in Kosovo that has production lines that compliment his material.

Approximately 70% of collected material comes from employees of Samria Plast and the remained comes from individual collectors. He pays 0.30 € - 0.50 € per kg.

**Company Background**

This company was established in 2003 as a sole proprioretorship. This company has 8 employees and has invested approximately 50.000€. He collects about 5 tons of plastic per month. His estimated annual turnover is 10.000 € to 12.000 €. He is very optimistic that this industry will continue to grow annually.

**Business Vision**

Mr. Jakaj is hoping to acquire a complete production line (grinder and canal). He is hoping to be able to acquire the funds from foreign investors or self-finance. He estimates this new investment to total 50,000. Main problems for Mr. Jakaj is electricity and fiscal policies.

He is skeptical that any international organizations or donors would be able to assist him since the amount he is seeking is high. Mr. Jakaj also said that is business is sustainable.

**General Information**

Name: Bajram Tahiri

Contact Nr: 044-142-179

Address: Ferizaj

Business Name: NPSH "Mbrojtja e Ambientit"

**Current Activities**

The company "Environmental Protection" since its establishment practiced the activity of waste collection in 13 villages of Ferizaj. Except metals and other materials, this company also collects strong plastic and PET. So the whole activity of this company is the collection of waste in these villages and then does the classification of waste collected.

The collection is done through driving means (vans and trucks) in each of these neighborhood homes. The company has put container by each house, purposely to easier collect the waste. A total of 835 containers are located in 13 villages, the collection is done twice a week.

For garbage collection, families are obliged to pay the price in the value of 4.5€ per month. Furthermore, after waste classification, the company makes sales of PET plastic in the value of 0.12 cents per ton, whereas strong plastic is sold for 0.20 cents per kg. PET plastic is sold in Macedonia, whereas strong plastic is sold in Kosovo.

**Company Background**

The company "Environmental Protection" was registered in 2006, but until 2008 it was not active. This company has a total of 5 full time employees. Annual turnover of this company is 25000-30000€.

Monthly collection capacity is 3 ton PET plastic and 1 ton strong plastic. So far the company has invested in the value of 15,000 euro for the purchase of motor vehicles and classification equipments which are:

1. 5 Vans
2. Rotary tape for waste classification
3. Shredders up to 100kg

As of expectations for business growth in the year of 2010, the business owner has expressed his optimism for a huge increase, up to 200%.

**Business Vision**

Company's objective is to expand services in 30 villages in order to increase its capacities. Expansion through villages will increase the number of PET's collection and other types of plastic. In addition, the company also plans to purchase 2 trucks and one shredder for PET. Mentioned investments are planned by the company to be realized in cooperation with donor organizations. So far all investments made are personal investments and through commercial loans. The company received 400 containers from Caritas Luxemburg.

The company faces the following problems:

1. Week collection
2. Lack of subsidies from the state
3. Outdated motor vehicles

4. Shredders with old dimensions

Investment needs are:

1. Investments in motor vehicles
2. Equipment for work
3. Containers



**General Information**

Name: Erhan Bula (Owner) Ilir Krasniqi (Manager)

Contact Number: 044-256-607

Address: Obiliq/Prishtina

Business Name: Plas-Kos

**Current Activities**

This company currently collects and processes PP, HDPE, and LDPE. The material collected is both post-consumer and post-production waste. This company obtains material from individual collectors which are paid 0.25 to .035 cents per kg. One major part of their business is obtaining post-industrial waste, processing until granules and sending that material back to the company.

**Company Background**

This company has been active since May of 2008. They have invested approximately 300,000 Euros. In 2008, they processed approximately 600 tons of plastic, for 2009 until now approximately 1000 tons. There are 25 fulltime employees with shift changes. They can process 600 kg per hour and 200 to 250 for finalization. They are expected a steady growth of 15 to 20 percent for 2010.

**Business Vision**

This company did commission a business plan from the company RIINVEST. According to this plan, they are expected to net 500,000 Euros in the next 3 years. Their main problems are electricity and fiscal policies. They are interested in obtaining assistance for lobbying for regulations on production and fiscal policies. They are very aware that their business is sustainable because of Kosovo's attempt to standardize according to EU standards. This company does have a certification for the production of tubes, their quality is guaranteed due to the process used.

**General Information**

Name: Mehdi Aliu

Contact Number: Kontaktues: 044-121-319

Address: Ferizaj

Business Number: Tiki-Niti

**Current Activities**

Since 2008, this company collects a wide variety of plastics, HDPE, LDPE, PP, PVC, and PET. Until recently this company has focused solely on metal recycling, but has established a plastic collection system and purchased a grinder. The post consumer waste is collected and bought for 0.14 cent per kilogram.

**Company Background**

This company has been active since 1992. This company has concentrated in the metal recycling industry and last year invested 15,000 Euros in a grinder machine and a compacter for PET. At the moment, the company has suspended their collection activities because they have been unable to find a serious buyer.

This company can collect 7 tons of PET per month and 25 tons of other plastics per month. The owner is very optimistic and says that once the global economic crisis has passed, the plastic recycling industry will see rapid growth.

**Business Vision**

This company hopes to be more attentive to the plastic recycling portion of their business so that they may increase exports and employ more individuals. Problems that this company faces are current legal framework and lack of institutional support, and lack of encouragement by the government to increase exports. This company would like to obtain approximately 100,000 Euros for operational capital and other investments.

**Company Information**

Name: Agim Kroni

Contact nr: 044-797-547

Address: Village "Bllacë"-Suharekë

Business Name: NTP "Kroni"

**Current Activities**

Kroni is involved only in recycling and PET bottles. Kroni has the most advanced technology in Kosovo for PET recycling. Equipments owned by the company offer the possibility of processing PET until the end of granule process.

PET's collection came from various regions of Kosovo by applying the combined method of collection. This means that part of the collection is brought from his own collectors, whereas part of PET is obtained through transport vehicles that Kroni owns.

The purchase price of PET until now has been 0.18 cents and the company still is challenged by lack of opportunities to sell PET plastic.

**Company Background**

Kroni Company was found in 2009 and stands as individual business of Mr. Agim Kroni. Investments made in the line of recycling capture the value of 220,000€, while the segment of equipments to finalize the raw materials is still lacking. Possible collection capacity is 3 tons per day, while recycling up to 300 kg per hour, and granule from 150-200 kg per hour.

Regarding annual circulation, it is not known yet because the company still is faced with lack of market for PET. So far the company has collected an amount of 60 tons for PET.

**Business Vision**

Kroni Company aims to become the factory for production of PET bottles, considering that they have advanced technology for such business.

Currently the company owner is making efforts in finding donations for completion of the production line. All investments made so far, are investments made from the owners savings while for the rest of the production the company is seeking donor or associate who would invest in the company.

Problems facing Kroni Company are: Lack of market for PET, lack of production line and lack of electricity that interrupts proper functioning of the machines.

Production line according Mr. Kroni would cost approximately 90,000€.

**General Information**

Name: Lutfi Salihu

Contact Number: 044-132-055

Address: Livoc i Epërm-Gjilan

Business Name: NTSH" Rival"

**Current Activities**

Rival Company performs its activity of collection and sale of HDPE in the upper Livoc of Gjilan. This company doesn't do collection of PET since there is no sales market for it. Steel is the focus of this company. HDPE is sold in the interior market by traders who collect large amounts of plastic. Usually collection is done through individual collectors, in the region of Gjilan. The purchase price of plastic is 0.10 cents while the price of sale is 0.20 cents per kg.

**Company Background**

Rival Company was founded in 1999 and recently they have been involved with plastic collection. Furthermore, this company has not made any investments in the sector of plastic, considering that colored and colorless metals are their main focus. This company has three fulltime employees, whereas collection capacity is 2 ton per month. Company's annual turnover is 5000-8000€ only in the plastic sector.

**Business Vision**

Development plans of the company are focused on capacity building in terms of workers as well as profits in the plastic sector. For this purpose the company intends to pursue training for staff and buy equipments that make plastic work easier. So far they have invested in the metal sector 40,000€, loans from commercial banks in Kosovo.

For capacity increase the company intends to buy a grinder to grind the plastic as well as attend staff trainings.

The problems facing this company are:

1. Lack of business-government cooperation
2. Lack of electricity
3. Fiscal policy
4. Lack of equipments

**General Information**

Name: Fadil Derrnogllava

Contact Number: 044-191-691

Address: Village Talinofc i Muhaxherve - Ferizaj

Business Name: Metal Elektro

**Current Activities**

This company collects PET and HDPE. Collection points are located in Ferizaj, Kacanik, Lipjan and Suhareka. This company also obtains material from individual collectors.

PET is bought at 0.20 cents per kilogram and sold for 0.30 cents per kilogram. It is important to note that this company is having difficulty finding favorable markets for sale of PET.

**Company Background**

This company was established in 2004 as a sole proprietorship. This company also collects metals and paper. For PET collection, current capacity is 3 tons per month and for HDPE 8 tons per month. Estimated annual turnover is 25000-30000€. This company employs 4 fulltime individuals.

This company expects a growth of 30% for the year 2010. Up until they have not invested much in their plastics collection division of the company because it was not a priority.

**Business Vision**

This company plans on increasing capacities by purchasing new equipment. A priority for the company is to purchase a compactor and grinder for plastics. These are estimated to cost 14.000€ which are planned to be acquired by donations or grants.

Problems that this company faces are unfavorable prices, lack of opportunities in PET market, lack of proper equipment, fiscal policies, and electricity.

**General Information**

Name: Valdet Shaqiri

Contact Number: +381 38/721 294/ 044-198-553

Address: Road. e Varrezave" Fushë Kosovë

Business Name: Rec-Kos

**Current Activities**

Rec Kos Company is one of the leading companies in the Kosovo market for trading and collecting colored and colorless metals. Moreover, the company is focused on the metal sector however; they have been involved in the collection of hard plastic as well. This company makes plastic collection mainly from individual collectors and other warehouses, and a small part of it comes from remains of factories after final product.

Price of collection is 0.10 cents while sales price is 0.25 cents.

**Company Background**

The Company was founded in 1999 as individual business, since then their main activity has been trading and collection of metals with regional countries and countries from Western Europe. The company has a total of 40 employees who work full time. Company's infrastructure is in good conditions considering that the warehouse space is 4 hectares, proving a good opportunity for effective work.

So far the company has made investments of 13,000€, buying: shredders, plastic grinder and compactor. Plastic collection capacity is 10 tons per month, while sales are done in Macedonia and in other European Countries.

**Business Vision**

Rec-Kos's objective is the transportation of metals and other materials by railroad transport, since the location of this business is very convenient for this type of transport.

Up to this moment, this company hasn't benefited any donation, which means that all investments done until now have come from personal savings. The company has chosen fiscal policy and electricity as the main issue in their business.

According to the z. Shaqiri the biggest contribution made to his company would be if changes occurred in the fiscal policy, implementation of policies and guidelines; assisting not licensed businesses to arrange the railway line for transportation of waste.

**General Information**

Name: Ismet Murtezi

Contact nr: 044/688-919

Address: Rr. "Gjorgj Washington", pn, Gjilan

Business Name: Rrezi-Com

**Current Activities**

Rrezi-Com Company makes collection and sales of plastic in the Kosovo Market. The company collects PET plastic and different types of hard plastic. Although the company deals with the collection and sale of metals, plastic sector is used as a secondary component which covers daily expenses of the company. All material collected comes from household dumped waste. Collection is done by individual collectors and in cases where the amount of plastic is heavy the company does the collection with its own means. In most cases collection is made by collectors and from the collection points in the region of Gilan.

Prices of hard plastic collection ranges from 0.10-0.15cents purchase price and sales price 0.25 cents, while the price of PET bottles ranges from 0.10-0.15 cents, the purchase price and the sale price is not known yet because of lack of the market for PET plastic.

**Company Background**

Rrezi-Com Company was established in 2007 and its primary activity is the collection and sale of colored & colorless metals. The company is individual business and has three full time employees. Companies annual turnover is around 10,000€ while collection capacity of PET and hard plastic is 2 ton per month.

In the plastic sector, this company has not made big investments, meaning that the company has only one shredder for PET plastic. As of business growth in the year of 2010, the owner of the company has mentioned that if they find trade for PET plastic, gathering capacity will then increase to 100%.

**Business Vision**

This company plans on increasing capacities by purchasing new equipment. A priority for the company is to purchase a compactor and grinder for plastics. These are estimated to cost 14.000€ which are planned to be acquired by donations or grants.

Problems that this company faces are unfavorable prices, lack of opportunities in PET market, lack of proper equipment, fiscal policies, and electricity.

**General Information**

Name: Bekim Bejtullahu

Contact: 044-405-918

Address: Podujeve/Prishtina

Business Name: Euro Plastika

**Current Activities**

This company is interesting because there are actually two separate entities within one family. Mr Bejtullahu has a production facility in Prishtina where he produces plastic bottles of various sizes for various purposes (dish detergent, cleaning liquid, etc.). In addition his uncle has a recycling facility in Podujeve where PP and HDPE is processed. This facility is very primitive in that it does not have a ceiling, but the machines and raw material are covered in plastic canvasses. The Prishtina facility obtains material from collection points in Fushe Kosove and Peja. The Podujeva facility imports raw material from neighboring countries.

**Company Background**

The Podujeva company has begun in Spring of 2009. Up until now the investments total 15,000 to 16,000 Euros. There are only 2 employees (father and son) and their processing capacity is 55 kg/hr. They are hoping that they will be able to function at current levels but not having a roof poses a serious problem for their facility.

**Business Vision**

The Podujeva facility's immediate plans are to build a roof/building to cover the machines and raw material. This would cost approximately 7,000 to 8,000 Euros. In addition they are also planning on purchasing a larger grinder, which is estimated to cost 5,000 Euros. The grinder's current capacity is only for small plastic items and for faster processing would like to purchase a larger grinder so that a plastic crate can be placed at once. All investments have been self-financed and they are not interested in acquiring loans due to high interest rates.

The biggest problem for this company is electricity. Upon our arrival, the electricity had just been lost and processing had been stopped. The machines were still warm from previous use. They are strong believers that the company does have sustainability because they continue to receive requests for material, but are having difficulty meeting those requests because of electricity problems.



**General Information**

Owner Name: Nijazi Ukshini

Contact Number: 044-133-147

Address: Kllokot (Road Ferizaj – Gjilan)

Business Name: PAJA

**Current Activities**

This company has been active in plastic recycling since 2004. This company collects PET and HDPE as well as PA (nylon). Collection points are located in Prizren, Ferizaj, Viti, Kamenica and Prizren. Half of the material collected is post industrial waste, which is a first class plastic (PET) due to its purity. The second half comes from supermarkets and minimarkets. Mr. Ukshini pays 0.10 cents per kg for HDPE/PET and .15 for PA. Exported material goes to Macedonia and Montenegro.

**Company Background**

This company was involved in a pilot program in Prishtina which was supported by SIDA. Waste containers were categorized by paper, plastic, aluminum and other. The residents of this neighborhood separated their waste based on the containers. Mr. Ukshini had 4 trucks that would periodically collect the material. This project was initially very successful, pick-up was regular, citizens were separating the waste, but in the end the project ended without further continuation.

According to Mr. Ukshini, the plastic recycling industry is stable and will continue to grow. He hopes to ensure growth by creating a regional waste collection system amongst surrounding villages.

**Business Vision**

As mentioned earlier, the regional waste collection system with surrounding villages would be arranged by Mr. Ukshini. He has written a project proposal which includes the collection all waste, which he will then categorize and process. Mr. Ukshini emphasized that this is very important because rural areas do not have collection systems and dump waste in impromptu landfills (illegally) which is not only harmful for the environment but the families living in close proximities. He has begun seeking funding for this program but until now has been unsuccessful.

Besides this program, Mr. Ukshini is also looking to establish a production line so that some or most of the material he collects, he can then process/grind and make granules. The cost associated depend on the type of production line and final products.

**General Information**

Owner Name: Sadri Gashi

Contact Number: 044-503-635

Address: Ferizaj – Prishtine

Business Name: CADI COMMERCE

Website: [www.cadi-ks.com](http://www.cadi-ks.com)

**Current Activities**

Mr. Gashi is a producer of brushes and brooms of various colors, sizes and purposes. He acquires his raw material from Greece, Macedonia, Bulgaria and Kosovo. His family has been in this business since 1974 but during the war endured tremendous damages to their factory and had to start from the beginning. The material he acquires from Kosovo is unpredictable (quantity and quality) and therefore relies heavily on imported material. He works primarily with HDPE, LDPE and PP. For imported material, he pays 1.10 per kg and Kosovo material 0.60 – 0.75 cents per kg. He is interested in acquiring more KS material if the quantity and quality was dependable.

**Company Background**

Total investments since 2000, is 500,000 to 600,000 Euros. He has 18 fulltime employees and produces approximately 7 to 12 tons per month, depending on orders and availability. He expects tremendous growth by 50 percent for export markets in Macedonia and Albania.

**Business Vision**

Mr. Gashi's immediate plans include expansion of production line to include new products. He is also very interested in PET recycling system, but says that costs anywhere from 1.5 to 1.8 million Euros. He was very skeptic that other companies in Kosovo have created PET recycling systems and was very interested to see their facilities.

Mr. Gashi is very active in this field and regularly visits neighboring countries to see the potentials in plastic products, new technology, and new opportunities. His knowledge of the industry is above average.

**General Information**

Owner Name: Gykmen Ademogullu

Contact Number: 044-576-927

Address: Ferizaj

Business Name: Gykmen Trade

**Current Activities**

As a foreign investor, Mr. Gykmen is collecting PET from restaurants and individual collectors. He currently pays 0.10 cents per kg and exports to Turkey. He has collected 1 ton of PET in the last 2 to 3 weeks.

**Company Information**

Mr. Gykmen is working with his brother and a local named Muharem Topali. He is been operating in Kosovo for 2 months and invested approximately 10,000 Euros. His current capacity is estimated to be 10 to 15 tons per month. He is skeptic about growth because of collection issues, high prices requested by individual collectors and unpredictable quantities.

**Business Vision**

This company is hoping to acquire 75,000 in addition financial resources to complete the production line. He has contacted USAID for assistance but has not received any assistance. Mr. Gykmen estimated that 100 tons of PET is currently being collected in Kosovo per month. He hopes that this business is sustainable once he completes the production line.

## **Annex IV: Minutes from meetings**

### **Minutes of meeting with Mr. Bujar Bujupi, Kosovo Environmental Protection Agency CEO**

**Location of the visit: Municipality of Gjakovë/Đakovica**

**Date of the visit: 25.09.2009**

**Time of the visit: 10:00**

**Participant in the meeting: Arijan Toska, Osman Raci, Bujar Bujupi -Director of the department for public services, municipality of Pristina**

Mr. Bujupi thoroughly explained the waste management system in Kosovo/Pristina. He explained that the PUC Pastrimi is responsible of collecting the waste from households and businesses in the municipality, the collection fee is set nationally and it is the same for all municipal PUC, the amount per household is 4,8 Euros. The landfill fee in the regional landfill is 6 Euros per tone.

All of the urban area is covered with collection. Pristina is one of the rare municipalities to have containers set in the neighborhoods. Mr Bujupi was not able to tell the number of containers in Pristina. Approximately 220 tones of waste are collected every day. The landfill fee is 6 Euros per tone.

The age of the waste collection vehicles is more than 20 years old.

When asked if the municipality is doing any recycling, he mentioned that few years ago containers for at source separation were set in several neighborhoods and mentioned that people reacted positively to the set program and amazingly most of the inhabitants used the containers. However, citizens stopped to use the containers as soon as they found that the PUC is collecting all types of garbage with one vehicle thus the motivation for citizens to continue with at source separation vanished.

### **Minutes of meeting with Mr. Ilir Morina, Kosovo Environmental Protection Agency CEO**

**Location of the visit: Municipality of Gjakovë/Đakovica**

**Participant in the meeting: Arijan Toska, Osman Raci, Mr. Ilir Morina, Kosovo Environmental Protection Agency CEO**

MESP through the Environmental Protection Department (EPD) is the authority of supervision and legal regulation of all environmental aspects of waste management. Its main role is to provide Policy framework and strategy for waste management sector as well as monitoring the implementation of its policies.

- (EPD) Monitors the situation of regional and local landfills
- Collects and processes data on local and regional landfills
- Collects and processes data on hazardous waste
- Maintains the data base on waste management
- Prepares the report on waste management
- Predicts and timely reports on risk from landfills

Mr Ilir Morina informed us that he has been asked by the prime minister personally to resolve the problem of Pristina landfill, for this purpose discussions and negotiations have commenced with a potential German investor for the regional landfill in Pristina. However these discussions with the German investor have been postponed until a feasibility study has been developed.

Regarding the EU directives on waste management, Mr. Morina said that Kosovo has adopted 13 EU directives concerning the field of environment. However when asked if any of these are implemented, he said that this is the burning issue, the EU directives have not been taken any step beyond adoption. He mentioned that the

directive on packaging and packaging waste is adopted on the other hand the National Waste Management Strategy is in the process of being developed and early findings reveal that recycling is the key instrument to resolve the issue of waste in Kosovo.

He requested to establish cooperative relationship on any future action on establishing plastic recycling activity in Kosovo. At this occasion he pointed that following the adoption of the National Waste Management Strategy; budgetary funds will be available for immediate action.

**Minutes of meeting with Mr. Agim Kroni, Owner of Kroni PET recycling plant in Suharekë/Suva Reka**

**Location of the visit: Kroni recycling Plant, Suharekë/Suva Reka**

**Date of the visit: 25.09.2009**

**Time of the visit: 10:00**

**Participant in the meeting: Arijan Toska, Osman Raci, Mr. Agim Kroni, Owner of Kroni PET recycling plant in Suharekë/Suva Reka**

1. Please tell us about your business: name, location, owner, etc. The name of the company is Kroni, Agim Kroni and his brother are the owners of the company; the company is located in Suharekë/Suva Reka.

2. What is your main business? Recycling of PET

4. How large, how many employees and/or seasonal workers? At the moment the company does not operate and no personal is active.

5. What materials do you handle, how many tons per month or per year?

None at the moment. However, for the first three months of operations in 2008 Kroni collected total 70 tones of PET waste which can be seen in the factory yard mostly in a baled form.

6. Did you buy materials or collected them yourselves? Most of the materials came from collection points like Lulebora in 2008

7. What did you do with the collected material, did you recycle it and sell outside of your country? Only one part of the material was recycled and due to technical problems encountered the remaining materials were not processed. Kroni attempted to export recycled material (PET Flake) to Austria and Italy but the buyers have refused to buy the PET flake produced in KRONI due to poor quality. The Austrian buyer has noted that the materials processed are contaminated with PVC.

8. Do you have fixed premises? He has his own fixed premises as well as a suitable storage area around the plant.

9. Do your premises have permission to operate, have you done environmental impact assessment? No and Mr. Kroni is not aware that he needs to obtain a permission.

10. What are your main operations? Mr. Kroni was not able to answer this question promptly.

11. What equipment do you have, how does it operate, where did you get it, how was it paid for? Kroni possess a recycling line including PET extruder, Mr. Kroni was not able to explain the operation procedure, the machines were bought in china through internet research and the machines were paid in cash.

10. Can you please tell us why you stopped processing? Mr.Kroni was very sincere and explained that at the beginning when the machines arrived he needed six months to install the machines. Immediately after beginning with operations the

grinding machine gets broken and still remains to be repaired, thus the recycling operation at Kroni have been halted.

11. How do you get your market information, how often? The information is obtained through Internet and through his brother in Austria; this is being done on regular basis. He is also aware that at the moment PET flake has an excellent price. However when we asked him that these are prices for customers who can deliver good on regular basis, he commented that this was also an issue that he is facing and all the discussions and negotiations with partners in Italy and Austria demand regular quantities of minimum 70 to 100 tones of good per month and constant quality.

12. Have you ever sold any quantity of PET flake abroad? No

13. What is your annual budget? There is no annual budget

14. Please tell us about the financing: all financing came from family resources

15. Are any of your operations or equipment financed by bank loans? No

16. Has the business ever had any loans or external donor financing? No

17. Is there a relationship between your business and the private banking sector? No

18. Are you working with the banks on business expansion or development? No

19. Have you been involved in donor loan or grant programs? Which ones? How have they worked? No

20. What are your plans? Do you have a business development strategy? Can you explain? Yes I have a business development strategy (Business plan developed by a consulting company)

21. What failed from the Business plan and why? It seems that he does not understand the business plan as well.

22. Please tell us about your relationships with collectors. The network of collectors was established in every municipality in Kosovo, the purchasing price per KG was 0, 15 to 0, 18 euro cents in 2008. However in 2009 the prices in the world markets have dropped significantly. Mr. Kroni revealed that some of the PET waste purchased has not been paid yet.

23. Did you work with Roma collectors? Specific ones or whoever comes along? No, the cooperation was established with scrap dealers

24. How many scrap dealers regularly did supply your business? 10 to 15 all over Kosovo

Do you know their names, where to find them? Yes, they are scrap dealers who adapted to collection of PET waste as well

25. What do you plan to do next? I do not know, repair the grinding machine

26. How much will cost to repair the grinding machine. About 2000 Euros

27. Why you did not repair it until now? The answer was confusing and

28. After repairing the grinding machine what will you do to improve the quality of the PET flake? At a specific moment he noted that he will ask his brother in Austria to deal with recycling and he revealed that he plans to go back to Italy.

29. In case you resolve all technological problems do you have enough working capital for collection of PET waste to restart with recycling? No

**Minutes of meeting with NGO CBC Mitrovicë/a Mr. Avni Alidema, deputy director Mr. Mladen Vukicevic**

**Location of the visit: Municipality of Mitrovicë/a**

**Time of the visit: 14:00**

**Participant in the meeting: Arijan Toska, Osman Raci, Mr. Avni Alidema, deputy director Mr. Mladen Vukicevic**

They were glad to Community Building **Mitrovicë/a** (CBM) is a local Non-Governmental Organization (NGO) based in Mitrovica, Kosovo, which was initiated in March 2001 by IKV (Interchurch Peace Council) from The Netherlands. CBM started its work with an International Director, working from one office in the southern, and one in the northern part of Mitrovicë/a. In the beginning of 2003, our organization was officially registered as a Kosovo NGO.

CBC Mitrovicë/a is a Local organization that identifies and advances joint interests of citizens through facilitation of interethnic dialogue and advocacy, as well as strengthening civil society against accountable institutions. The most recent project lead by Mr. Mladen Vukicevic is the rock school implemented separately on both sides of the city with mutual events taking place out of the town.

The mission of the visit was explained by Arijan Toska with focus on including NGOs in public awareness activities to take place on local level. A thorough explanation of the functioning of the recycling clubs and activities within schools in Macedonia was delivered. Both Mr. Alidema and Mr. Vukicevic that environment and nature protection are of mutual interest of all citizens in Mitrovica and as it is with the rock school, mutual events taking place on both sides of the river can be executed both to protect the nature and to build confidence

They are also keen to take plastic recycling activity and present it to the donor community as possibility to raise public awareness, build confidence as well as assist creation of job opportunities...

**Minutes of meeting with Murat Dakaj, Europak Mitrovicë/a:****Location of the visit: Municipality of Mitrovicë/a****Date of the visit:****Time of the visit: 14:00****Participant in the meeting: Arijan Toska, Osman Raci, Murat Dakaj, Owner of Europak**

The Company was established in October 2007. Its business activity and service is the export of paper and other waste destined for recycling. At the moment of our visit the company was in the process of moving to a new location. As the new location was not ready yet we went to see the old location which was practically an old garage where there was baling machine used only for paper. At the moment of our visit the place was not functional. Mr Dakaj was very controversial in answering the questions about how much quantity he collects and sells. Who his buyers are what type of bale he is making, how his network of collectors is organized, prices type of materials collected.

Note: Further cooperation with Mr. Dakaj and Europak depends on a additional field visit to confirm that the company is continuing to operate in the new location.

**Modernization and Recycling in Municipality of Gjakovë/Đakovica**

**Minutes of meeting with:****Section 1 Meeting Mr. Bernard Frokaj-Director of the department for public services****Section 2 Meeting Mr. Nehar Grqari PUC, legal advisor****Section 3 meeting with Roma informal collector in the Transfer station****Section 4: Meeting with the scrap dealer in Gjakovë/Đakovica****Field visits****Location of the visit: Municipality of Gjakovë/Đakovica****Date of the visit: 25.09.2009****Time of the visit: 10:00****Participant in the meeting: Arijan Toska, Osman Raci, Bernard Frokaj-Director of the department for public services****Section 1 Meeting Director of the department for public services****The following questions were articulated with**

1. Please tell us about your solid waste system:

The department for public services within the municipality of Gjakovë/Đakovica is directly involved in waste management; the head of the department cooperates closely with the board of directors of the public Utility company that has been recently selected. The board of directors is made of three persons and one of them acts as executive of the PUC.

All plans and programs regarding waste management as well as issues concerning the current landfill and the transfer station are planned in cooperation between the Municipality (Department for public works) and the Public utility Company.

2. operations – dumpsite or landfill – where, how long can it operate, how many tons per day or per year, public, private, shared, any plans to close it and move to regional landfill, when? Any conflicts with residents

The current landfill used is officially closed by the ministry of Environment due to it being close to an inhabited area as well as the poor maintenance of the landfill. The same is still being used because of the high cost of transportation of the regional landfill. Approximately 40 tones of waste are being landfilled every day. The plan for closing the landfill and transforming the same exists, however the municipality does not have the financial means to implement the plan. The approximate cost to close down and to transform the landfill into transfer station including a sorting facility is 100000 Euro. Residents nearby react to the smell that is coming from the landfill.

3. In terms of waste collection, do you provide to residents and businesses? How much of city is covered, what frequency is waste collected, is it different in the centre from the outskirts, and villages? what percent in individual household containers?

Almost all the urban area is covered with waste collection which makes up approximately 60% of the Gjakovë/Đakovica population, Mr. Frokaj was unable to answer the rest of the questions and ask us to approach PUC Cabрати officials

4. What kinds of trucks, how many, how many are on the road and how many in Reserve/being repaired? Most of the collection is done with tractors, while they possess waste picking truck.

5. Is there solid waste service in the villages? Do the villages pay for waste?

Management? No there is not solid waste service in the villages, they manage their waste on their own thus many illegal dumpsites exist in the area.



6. Are you doing any recycling? Since when? Yourself or with some private business.  
No

7. Can you tell us about the amounts of waste and recyclables, per month, per year?  
We were requested to extract this info from Cabrati

8. How do households and businesses pay for collection? What percent pay? How much do they pay? The collection of the fee is the most bitter issue, collection is done by Cabrati employees and exact info can be obtained from Cabrati.

9. Please tell us about recycling, yours and that of the private and informal sector. There is no recycling done by the municipality, however private firms collecting metal paper and plastic exist.

10. Are there Roma collectors scavenging the landfill? Do you give them permission, throw them out, how does it work? Do children come onto the landfill to pick materials and earn pocket money? Most probably there are Roma collectors; we were again pointed to discuss the issue with PUC Cabrati.

17. Are you allowed to borrow money as a municipality? Would you consider doing it? Not at the moment, yes in case the necessary conditions are created.

The municipality of Gjakovë/Đakovica generally needs technical, financial, and Institutional support as they modernize their solid waste systems.

The land filled in Gjakovë/Đakovica has been closed by the Ministry of Environment; however the PUC is still land filling its waste in this landfill, according to the agreement with ministry of environment the waste has to be land filled in the regional landfill in Landovica which is 35 KM far from Gjakovë/Đakovica.

There is little or no understanding of the implications of the changes associated with modernization of waste management.

While they mentioned the issue of the landfill, they did not appear to know what a modern landfill is, or what it costs.

There was little (demonstrated) understanding of the related sitting issues, capital costs, technology, environmental protection, tipping fees, hauling distances.

There is not yet any understanding that a policy for regional land filling requires Formation of regional institutions to organize the financing and management of the landfill and the movement of waste to it.

The introduction of landfill fees is in its infancy. This means that avoided costs of Land filling is not any kind of a factor in motivating prevention, recycling, and volume Reduction, or related activities, however as the competencies of landfills are in a process to be transferred to local authorities, they are adapting their selves to the new realities. Gjakovë/Đakovica municipality has started to construct the transfer station with a purpose to set sorting activities in order to reduce waste volumes to be transported to Landovica Land fill, 35 KM away from Gjakovë/Đakovica.

Municipality of Gjakovë/Đakovica forays into PET recycling are driven by ideas about volume reduction.

The municipality of Gjakovë/Đakovica assisted by REC is in the process of developing LEAP and has committed 20000 Euro for implementation of LEAP priorities, while on the other hand REC has committed 40000 Euro, first findings of the LEAP indicate the issue of waste management, transfer station and setting a sorting line in the transfer station with the sole purpose to reduce volumes to be transported to Landovica Land fill.

## **Section 2 Meeting with legal advisor of “Cabrati” Public Utility Company,**

The public utility company covers 60% of the population in Gjakovë/Đakovica, most of the coverage is the urban city area, while the rest of the population, mostly rural is not serviced. Approximately 50% to 60% of the population pays on regularly basis the waste management fee of 4.8 Euro per month. The collected waste is land filled in Gjakovë/Đakovica Landfill which officially has been closed by the ministry of environment, approximately 40 tones of waste per day is collected. The number of households was not reveled in this meeting as well as the total amount of the fee collected

The Cabrati, a municipally owned company, is the operational entity for solid waste. It does implementation, supervision, and daily control.

In this meeting it was pointed that the cost impact of increased distances and increased fuel prices for land filling have stopped them from land filling in the regional landfill. Land filling cost per 1 MT of waste in the regional landfill is 6 Euro.

Two years ago thy have purchased a truck with the main purpose to adapt transportation to the regional land fill, However the truck has not been operating for the past two years and the same ls not functional.

The official urged for assistance in resolving the issue with the landfill and constructing the transfer station as well as setting a sorting line in order to reduce volumes of waste to be transported to the regional landfill.

The Director of PUC CABRATI is actively engaged with the preparation of LEAP, and once again we were acknowledged that waste management with the possibility of recycling is set as issue number one in the LEAP.

Both Municipality of Gjakovë/Đakovica and the Public utility Company see the Roma informal sector as related to their solid waste modernization process and believe that the Roma informal collectors can be part of a sorting facility in the transfer station. Even though illegally the Roma informal collector operate at the transferee station and they collect all other types of plastic except PET.

### **Section 3 meeting with Roma informal collector in the Transfer station**

Below are some of the questions that were addressed to Roma collectors:

How do you usually get materials? Do you work in streets, and from containers, from the landfill, when people call you, house-to-house?

Most of the materials come from the landfill and only part of the scrap comes from collection in the streets.

Which materials do you handle? Do you sell all of one particular material only to one particular buyer, or many? Buyers come to you, or do you go to them?

From Plastics, HDPE and LDPE are handled while, PET bottles due to the very low price is not handle. For different materials they have different buyers, buyers approach them. At the same time they collect paper and Metal.

What kind of equipment do you use for processing and transport? They have baling machines for paper and metal, specially made bicycles are used for transport of materials to baling points.

Where did you get this equipment? They have bought the equipment from their own financial means.

Is the money better than you could earn some other way? There is no other way to earn money.

How much you earn per month? 200 Euro per person

Is all of your family dealing with collection? Yes

Do the grandparents and children also collect? Yes

Do the children (also) go to school? Yes

Do you use protection equipment? No

Many Roma families in the municipality of Gjakova depend on recycling materials from waste from the transfer station for their livelihoods.

However the current form of collection exposes the Roma collectors to health and social risk and on the other hand, it provides significant economic benefits that need to be retained.

The discussion with the Roma collectors revealed that they are not collecting PET due to the poor market price of only 0, 05 Euro Cents.

However they commented that they would be interested to collect PET for at least 0, 07 Euro cents. According to Roma collectors up to 500 kg of PET can be collected in one day as is. They commented that in case the transferee station is constructed and a sorting line is set, quantities of collected PET can go up to 1000 KG per day.

#### **Section 4: Meeting with the scrap dealer in Gjakovë/Đakovica**

This scrap dealer in Gjakovë/Đakovica Municipality has been operating for more than five years; the main reason to start collection of scrap materials was get self-employment.

This business is mainly on collection of metal waste and LDPE and HDPE, however he pointed that the main problem in Gjakovë/Đakovica municipality is PET bottles laying all over the place.

In 2008 he has been collecting PET bottles and stopped collecting in 2009 because of the poor demand and the low price. However he believes that due to the large volumes of PET waste in the area in case PET buying price goes up, large volumes of PET can be collected.

He is closely collaborating with Cabrati employees, from whom he is buying the scrap materials that they recover from waste collected.

At the moment he has 3 permanent employees 3 while the collection Network varies from 10 to 20 persons.

For each type of material collected he has different buyers, last year he has been cooperating with three companies who purchased and exported PET.

He has only one place for purchasing and was not aware if he needed permission to operate.

He mentioned that at the moment he does not have market information; however he has heard that PET prices are going up in the neighboring countries (Serbia and Macedonia)

He has a baling machine for scrap metal, and possesses one truck used to transport material to the buyer. He has no purchase orders, contracts, or some

Other arrangement.

None of his operations and equipment is financed by a financial institution.

He has not been involved in any type of grant programme.

He does not possess a business development strategy.

#### **Minutes of meeting with Mr. Avni Bickaj, Operations manager, KosInvest**

**Location of the visit: Pristina, Kosinvest**

**Date of the visit: 25.09.2009**

**Time of the visit: 10:00**

**Participant in the meeting: Arijan Toska, Osman Raci, Avni Bickaj, Operations manager, KosInvest**

**Kosinvest is a local NGO with an international character established in Kosovo with a main objective to assist micro businesses through providing small loans.**

**The primary target group is the marginalized population living in poverty.**

The aim of this meeting was focused on understanding the possible role of financial institutions in lending to the informal sector through combined training and coaching assistance provided by KPEP.

In this meeting Mr. Bickaj clearly indicated that informal sector can become clients of the financial institutions as well as become sustainable consumers of financial institutions. He mentioned that they are opened to discuss possible grant programs combined with small loans.

So far Kosinvest had no collectors as clients; however they have a substantial number of Roma clients, mostly displaced persons and have had many conditional grant schemes with various donors.

Improvement of access to finance is one of the several interventions in growing businesses of the informal sector in the second stage.

#### **Minutes of meeting with Mr. Arben Çitaku, Acting Permanent Secretary and Mr. Muhamet Malsiu, Ministry of Environment and Spatial Planning Director of Environment Department:**

**Location of the visit: Premises of the Ministry of Environment and Spatial Planning Municipality of Pristina**

**Participant in the meeting: Arijan Toska, Osman Raci, Arben Çitaku, acting permanent secretary and Mr. Muhamet Malsiu, Ministry of Environment and Spatial Planning Director of Environment Department**

Mr Malsiu and Mr Çitaku explained the existing legislative on waste management and newly drafted law on creating the environmental fund.

MESP is responsible for developing policies, implementing laws and supervising activities for environmental protection including water resources, air, land, biodiversity and waste management. It also sets norms and standards as well as supervising their implementation, monitors and determines the state of environment manages infrastructure, promotes educational environmental campaigns and public awareness and new technologies.

MESP through the Environmental Protection Department (EPD) is the authority of supervision and legal regulation of all environmental aspects of waste management. Its main role is to provide Policy framework and strategy for waste management

sector as well as monitoring the implementation of its policies. EPD compounded by these sectors:

Mr. Malsiu stressed that Sustainable waste management means effective utilization of the resources through lower quantity amount of waste generation, its reusing or recycling however he stressed that the ministry does not have any financial means initiate any programs on the above said.

Mr. Çitaku explained that the newly drafted law aiming to create the environmental fund is base on the polluter pays principle. Every company that generates waste will have to pay a certain fee base on the quantity of the generated pollution. The fees collected will be managed by the environmental fund an independent body within the ministry of environment. The funds will be spent on annual programs developed by an independent committee composed of participants from social life public life, businesses, civil society and experts. He noted that most probably recycling will inevitably have a key place in the program as the government of Kosovo has declare the issue of waste management as problem number one in the country.

In dealing with waste management both of them noted that the objective of the ministry is to protect the environment, lower quantity amount of waste for disposal which can be done by recycling, extension of the exploitation period of disposal sights which can be done by recycling programs.

Both of them stay keen to see a recycling program implemented in Kosovo and remain open to cooperate in the process of implementation of a possible Recycling project both on policy level as well as on matching funds on mutual activities.

#### **Minutes of meeting with Mr. Zeqir Veselaj, Director of REC, Field Office Kosovo**

##### **Location of the visit: REC premises Municipality of Pristina**

**Participant in the meeting: Arijan Toska, Osman Raci, Mr. Zeqir Veselaj, Director of REC, Field Office Kosovo**

REC (Regional Environmental Centre) in Kosovo is active in assisting 5 Municipalities in developing LEAP (Local Environmental Action Plans). Local Environmental Action plans are used as tools on local level (municipal) to identify problems concerning the environmental protection as well as prioritize the problems. LEAPs determine the necessary financial means and sources of finance to solve prioritized problems on local level. Leaps are part of the sustainable development processes in the municipality and facilitate the mobilization of the local resources both financial and human.

REC field in Kosovo is assisting five municipalities to develop LEAPs. The solutions to the problems foreseen with the LEAPs are in line with the EU directives on environment.

Mr. Zeqir Veselaj informed us that the municipalities of: Ferizaj/Uroševac, Pejë/Peć, Gjakovë/Đakovica, Prizren and Gjilan/Gnjilane are included in the first phase of LEAP.

Mr. Veselaj thoroughly explained the Process of LEAP development stressing the fact that working groups are composed from a variety members of the community Public sector(municipal administration, public utility company, schools), private sector (relevant businesses in the municipality), civil society (NGOs).

The first findings of the LEAP are in all five municipality reveals the fact that waste management is prioritized as problem number one. REC Field Office Kosovo has secured 40000 Euros per each municipality, finance to be used for implementation of

the priorities. Each municipality has committed 20000 Euros in cash for the same purposes.

After listening to the purpose of our visit, Mr. Veselaj urged us to closely cooperate in case KPEP decides to support Plastic Recycling activity in Kosovo. He informed us that he insisted that LEAPs are adopted after the upcoming municipal election by newly elected municipal council.

It has been agreed that information on the process of Kosovo Plastic recycling activity is shared timely in order to plan mutual activities.

### **Minutes of meeting with Mr. Haki Kola, SNV Team Leader**

**Location of the visit: Pristina SNV premises**

**Date of the visit: 15.09.2009**

**Time of the visit: 10:00**

**Participant in the meeting: Arijan Toska, Osman Raci, Haki Kola, Team Leader**

SNV is an international development organisation of Dutch origin with over 40 years of experience. They currently work in Kosovo only in the field of forestry however they plan to expand to tourism as well. SNV supports national and local actors within government, civil society and the private sector to find and implement local solutions to social and economic development challenges within the forestry industry.

After thorough explanation of the mission and the purpose of the visit both parties agreed to remain open for communication and cooperation in case the KPEP decides to support Kosovo Plastic recycling activity. Possible areas of cooperation are as follows:

1. Public awareness
2. Possible interaction in tourism in case this sector is supported by SNV as an indirect support through plastic recycling
3. Mutual Training and capacity building can also be interacted