



საქართველოს მწვანეთა მოძრაობა  
(ფედაშინის მეგობრები - საქართველო)



# გარემო და საზოგადოება

საქართველოს მწვანეთა მოძრაობის პერიოდული გამოსცემა, № 2 (20) 2012 წელი

Prepared by the Project "Clean Up Georgia – Raising of Public Awareness and Involvement in Solid Waste Management Improvement"

Situational analysis of the green economy development in Georgia  
on the example of solid municipal wastes recycling

Clean Up  
დავსუფთავოთ



Georgia  
საქართველო



SWEDEN

The journal was published by the financial support of the Swedish International Development Agency in the framework of the project "Clean-Up Georgia–Raising of public awareness and involvement in solid waste management improvement in Georgia"



## INTRODUCTION

At the turn of the millennium, global economic and environmental crises, which has risen in the world, has put on the agenda the necessity of changes of existing economic concepts and environmental attitudes, since the existing “brown” economic approaches, where the main accents are shifted to economic growth and social and environmental needs are ignored, have not ensured avoiding economic crises, overcoming of poverty, and reduction of environmental risks. There is an overall consensus that it is necessary to overcome imbalance between three pillars, which determine the well-being of a human: economic benefit, worthy conditions of working and living of human and harmonic co-existence with natural environment. As a follow up to this challenge, the new economic concept and vision of development, the so-called “green economy” was developed “which will be able to address natural and financial capital much more effectively and efficiently in the future”<sup>1</sup>.

The “green” strategy of development is directed at the mutually complementary aspects of economic and environmental policy. “The main requirement of the concept of green economy is the cost of natural and social capital as production factors and their role in the growth of production and increase of well-being to be envisaged fully in economic activities”<sup>2</sup>, as well as reduction of environmental impact assessment, and introducing effective economic methods.

## “GREENING” OF THE WASTE SECTOR

“Greening” of the waste sector assumes introduction of the principles of green economy and approaches in waste management, in particular:

- 1) “Avoiding waste generation, in the first place, by means of social practice based on sustainable development;
- 2) Minimization of waste generation;
- 3) Restoration of waste material and energy. While there, where waste generation is inevitable, production of usable product through secondary recycling<sup>3</sup>;
- 4) Recycling of any useless waste through environmentally friendly or less harmful technique”.

In Georgia, the existing approaches and practices of waste recycling and disposal are mainly based on “at the end of the pipe” principle, and use such inappropriate techniques as waste incineration

(without getting the energy) and disposal at the landfill. For the “greening” of the sector it is necessary to shift to solid waste integrated management system, which is based on “waste management hierarchy”, which assumes waste management in an integrated way at every stage of its generation and movement.

One of the important components in the “greening” of the waste management sector is waste recycling (reuse, reprocessing) and its re-incorporation into economic cycle as the type of secondary raw material and product. Realization of the principles of “green economy” and its efficiency reveals itself most vividly in the sphere of waste recycling (reuse, reprocessing). In particular, new space for economic activities is created, employment and well-being is increased, and environmental impact is reduced. The level of development of recycling sector significantly determines the degree of the “greening” of the economy.

<sup>1</sup> Global Green New Deal”. Policy brief. United Nations Environment Programme. March 2009.

<sup>2</sup> OECD, Green growth strategy

<sup>3</sup> UNEP, 2011, Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, The goals and indicators for greening the waste sector.



## WASTE MANAGEMENT, INSTITUTIONAL ORGANIZATION AND REGULATION MECHANISMS

“Second Review of the State of Environment of Georgia”<sup>4</sup> published by the UN European Economic Commission, also other studies in the field waste management in Georgia<sup>5</sup> confirm that in Georgia the waste management sector is still at the stage of formation and requires radical changes in management techniques and significant – both technical and financial – support in the direction of the “greening” of the sector.

There is no national policy and objectives in the field of waste management formed in Georgia. Legislation connected with the waste is fragmented and encompasses only some separate aspects. “Waste management hierarchy”, relation of waste prevention to resource saving, and consideration of wastes as resource is alien for Georgian legislation. There is also neither responsibility of producer with respect to the waste nor encouragement mechanisms for resource saving and less waste generation.

Domestic waste management is carried out by means of the rules established by local authorities. This largely assumes waste collection and disposal at landfills. There are no requirements for separated collection of wastes. Waste generation and management by large industrial facilities is being regulated within the framework of environmental impact permit, but legislation does not specify anything regarding waste minimization, introduction of new waste-free technologies, and other “incentive” mechanisms with regard to waste recycling and their volume reduction, which is fairly well indicated in the relevant directive of the EU.

Proceeding from this, the process of environmental impact permit in Georgia (in accordance with current legislation) assumes the insurance only waste collection and their disposal at the “landfill”, which practically makes environmental impact permit only formal and in no way facilitates the “greening” of the sector.

Inspecting of waste generating individuals because of limited resources is also problematic. There is altogether no control of waste generation and management of those industrial facilities, which are not subject to environmental impact permit. Waste management planning is problematic. Georgian legislation does not require presentation of waste management plans. Accounting regarding wastes, their sources, transportation means, type of neutralization etc. by waste generator, collector or transmitter is not established. National statistics regarding the movement of wastes is not carried out “In Georgia, there are no sanitary landfills, segregation or waste-based energy production facilities. Recycling facilities are very limited, and composting is only done by some farmers for their own use. Waste management requires urgent attention from decision-makers. There has been hardly any improvement since 2003, and the current situation is dramatic. There are no general policies or plans of action; the existing legal framework is inadequate; and the institutional set-up poses problems due to a lack of staff and funds. Waste continues to be disposed of inappropriately.”<sup>6</sup>

## SOLID MUNICIPAL WASTES

There is no any detailed and reliable information regarding the amount of solid municipal wastes in Georgia. In different studies and reports of waste sector (GEO-city Tbilisi (2011), Environmental Performance Reviews (Second Review) we encounter different evaluations of generated municipal wastes. According to „Environmental Performance Review“ this is 2,4 million m<sup>3</sup> per year, from which 46% of total volume comes on the city of Tbilisi. According to “GEO-city Tbilisi

(2011)”, generation of 350 000 tons of solid municipal wastes takes place in Tbilisi, which constitutes 45% of solid municipal wastes generated in the country. Correspondingly, we in Georgia have 778 000 tons of solid municipal wastes per year. 70-80% of these comprise domestic wastes generated from population, while 20-30% are the wastes generated from other sources (such as: offices, shops, supermarkets and trading centers, markets, administrative buildings, schools,

<sup>4</sup> UNECE, Environmental Performance Reviews, Second Review

<sup>5</sup> Green Business Support Strategy For Georgian Private Business Organizations And Employers’ Associations, by Zaal Lomtadze, Nato Kirvalidze

<sup>6</sup> Environmental Performance Reviews, (Second Review) Chapter 7.6.

restaurants, hotels and tourist facilities, swept trash of street and gardens).

Lack of information regarding the movement of wastes makes the dynamic of waste volume

growth more complex, although according to different economic estimations they expect 2.25% growth of municipal waste per year in Georgia.<sup>7</sup>

## STRUCTURE OF MUNICIPAL WASTES

“The analysis of the waste generated in Tbilisi” in 2003 by “Gerhard Blumenrother” as well as studies on waste structure conducted within the framework of “The project on feasibility study of building and exploitation of the polygon of solid domestic wastes of the city of Tbilisi” by scientific research firm “Gamma” in 2010, present certain

information regarding the structure of municipal wastes.

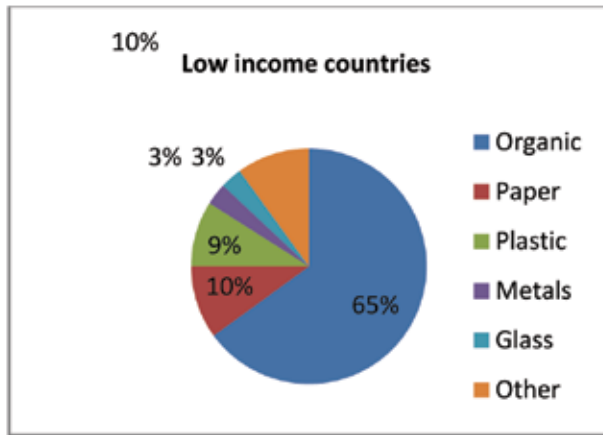
The study shows that the structure of municipal wastes in 2003-2010 has actually not changed, unless we count changes in organic waste and residue fraction, which may be the result of the methodological difference of the study, and not

Composition of wastes (kg), 2003 <i>Gerhard Blumenrother, 2003</i> <i>“The analysis of the waste generated in Tbilisi”</i>		Composition of wastes (kg), 2010 <i>Scientific Research firm “Gamma”</i> <i>“The project on feasibility study of building and exploitation of the polygon of solid domestic wastes of the city of Tbilisi”</i> 2010	
paper	5%	paper	6%
plastic	6%	plastic	6%
inert materials	5%	inert materials	5%
metal	3%	metal	3%
textile/leather	3%	textile/leather	3%
organic wastes	33%	organic wastes	71%
residue fraction	40%	residue fraction	1%
green wastes	3%	green wastes	3%
hygienic wastes	2%	hygienic wastes	2%

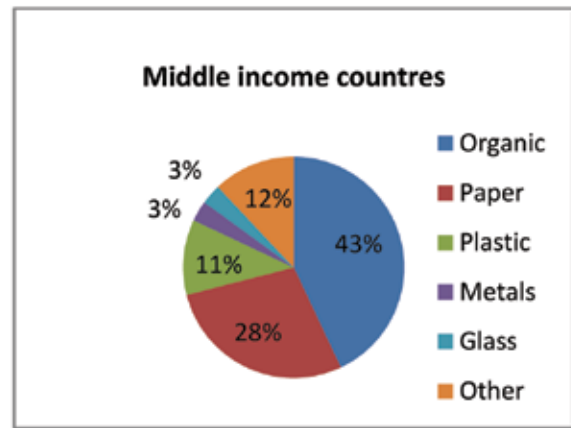
some particular change. However, the fact that glass did not appear in either case of the structure of wastes allows the pre-condition for ambiguous interpretation. In particular, glass is included into residue fraction or in municipal wastes. We encounter glass in insignificant quantities, which by itself means that mass collection of glass containers occurs by so-called “pickers”. Comparative analysis of the structure of the waste

of other countries gives us certain information about the specificity of Georgian waste market. The structure of wastes in Georgia resembles the waste structure peculiar for low income countries, which is expressed by high composition of organic waste and relatively low index of paper and plastic.

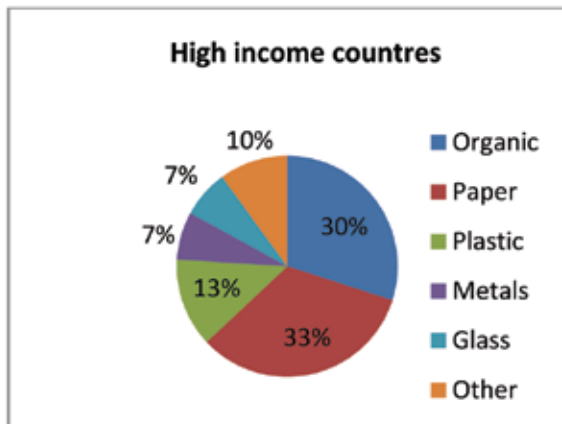
<sup>7</sup> GEO-city Tbilisi (2011).



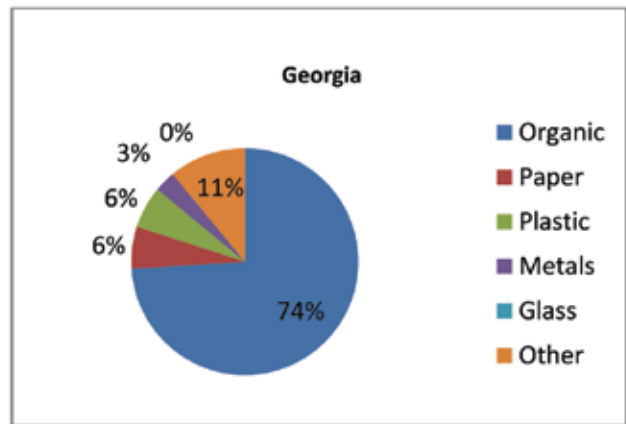
Source: UNEP Towards a green econo



Source: UNEP Towards a green econo



Source: UNEP Towards a green econo



Source: Gerard Blumenrother (2003)  
Analysis of the waste generated in Tbilisi"

## WASTE MARKET

Four basic factors determine the formation and increase of the waste market:

- 1) Increase of general volume of wastes and diversity of generated wastes;
- 2) Political awareness that better waste management is necessary for avoiding environmental and health risks;
- 3) Urbanization, under increasing economy, accompanied by increased interest in creating better living environment and, correspondingly, better waste management;
- 4) Formal and informal trade with secondary raw materials received from the wastes.

However, for the "greening" of waste sector of crucial importance is changing of consumer's attitude towards recycled products. It is important to raise public environmental awareness, so that more people have trust and need for recycled products.

The research on waste recycling enterprises conducted by us showed that the enterprises often try to conceal that commodity is produced from

secondary raw material obtained through recycling, in order not to frighten off the consumer. The majority of consumers are not sure of the safety of products obtained from secondary raw materials. This problem is generally peculiar for secondary resources markets and needs precise definitions and drawing of borders between "waste" and "non-waste" products. The ability of waste to be re-used, to be introduced in a recovery process (where the waste acquires increasing value), and the risks which it represents for the health and the environment thus appear as qualification criteria for the loss of waste status. It is essentially the clear definition of the borderline between "waste" and "non-waste" which appear decisive for the economic players in the waste market. It is in terms of materials which can be recovered, recycled or re-used, and thus definition of the terms "recovery", "re-use" and "recycling" that the borderline beyond which waste ceases to be waste is situated. The whole problem is to reach a clear and precise

consensus of opinion on these definitions, and this debate has not yet been settled.<sup>8</sup>

Neglecting the “green” approaches of waste management in waste management policy of Georgia significantly influences the formation of waste market. In particular, 100% of solid municipal waste collected by municipal service will be disposed at landfills without any treatment. Correspondingly, the fall-out of the waste from economic chain occurs, and driving out of the waste as secondary raw material or product from the market. Correspondingly, we get the situation, when 100% of the waste market is informal. Owing to such unreasonable policy:

- 1) Population experiences damage, since the whole load of “caring” for municipal wastes transfers to population in the form of payment for “garbage”. In particular, it costs 148 GEL per year for Tbilisi population to care for 1 ton of municipal wastes, and this load will increase parallel to the growth of waste volume and diversity.
- 2) There are no effective economic incentives for waste reduction. Correspondingly, fulfillment of main task of waste management is not ensured: excluding environmental and health risks caused by generation of wastes.

#### Solid municipal wastes disposed at landfills

Waste name	total volume %	ton/year
paper	6	46 680
plastic	6	46 680
metal	3	23 340
organic waste	71	55 2380
green waste	3	23 340

*The source: Gerhard Blumenrother (2003). “Analysis of wastes generated in Tbilisi”*

provide references that there are small ventures, which recycle plastic and plastic bottles and produce secondary raw material in small quantities, also small artisan paper enterprises, which manufacture toilet paper and that the main problem of development of this sector is high cost of treatment and little volume of wastes (GEO-cities Tbilisi: Integrated environmental assessment of the state and condition of the capital of Georgia, 2011).

In spite of existing skeptical assessments, during the last 4-5 years there has been going the process of active formation of waste market in Georgia. Those municipal wastes, which have been collected and warehoused from different sources of waste collection or generation, reach the waste

The state policy considers the wastes as a negative load accompanying economic activity, which should be gotten rid of as safely as possible, and not as a resource, which should get included in a renewed way into economic chain as a secondary raw material or product.

The main objective of waste management is safe transporting and disposal of generated waste. Reduction of waste generation and minimization of landfill-disposed waste through stimulation of clean technologies, introduction of sustainable development practice and activation of market mechanisms facilitating secondary treatment is neglected. Correspondingly, the practice introduced and implemented in Georgia does not meet modern challenges and needs radical change in the direction of “greening” of waste management.

Proceeding from the structure of the wastes, the amount of solid municipal wastes, which can become subject to recycling and composting, comprises 89% of the total amount the wastes disposed at the landfill, which makes the existing unreasonable practice of waste management even more vivid.

To date, there has been any deep waste market research carried out in Georgia. Various reports

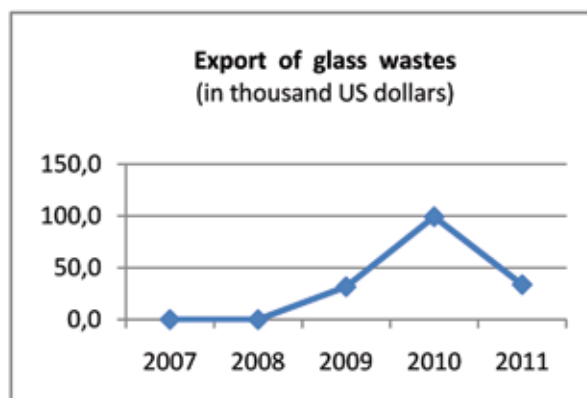
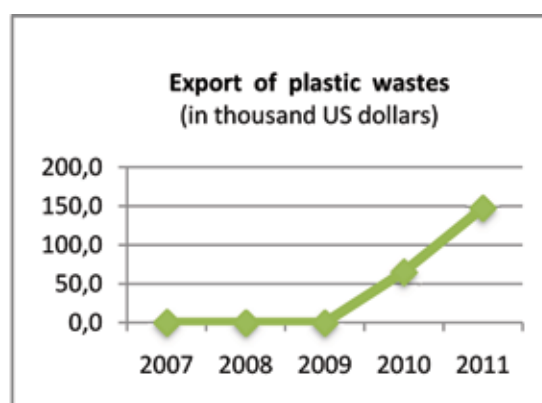
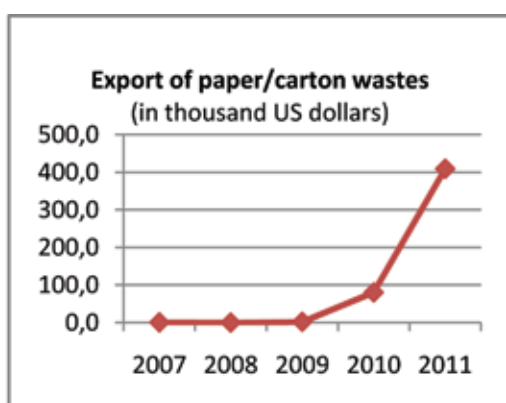
market. In spite of informality of the market, the organized network of collectors is operating, which reacts to the needs of the waste market. Both local recycling ventures and waste markets of neighboring countries pre-condition the need for wastes. In Georgia, the waste market volume can be evaluated by means of the adding of waste export and recycled waste inside the country during the year.

The dynamics of export of different types of wastes from Georgia shows that the waste market is dynamic and quite voluminous. Its export volume is comparable with the volume of product exports of other economic sectors. During the last five years, the share of waste export volume fluctuates in the whole export within the limits of 8-12%.

<sup>8</sup> philippe chalmin catherine gaillochet , From waste to resource an abstract of world waste survey 2009

	Export of wastes by years (in thousand US dollars)				
	2007	2008	2009	2010	2011
plastic	0,2	-	-	65,7	147,9
paper/carton	0,8	0,1	2,2	80,4	409,3
Glass debris	-	-	31,7	99,3	33,8
ferrous metal scrap	96 871,8	128 532,3	63 616,0	109 380,9	116 811,6
copper scrap	37 051,8	29 726,7	19 013,2	41 666,7	48 112,3
aluminum scrap	16 184,7	14 212,7	5 556,5	13 308,7	17 616,9
total waste export	150109,4	172471,9	88219,6	164601,7	183131,9
total export from Georgia	1232110,5	1495345,2	1133622,4	1677472,1	2189135,8

The source: National service of Statistics of Georgia



The source: National service of Statistics of Georgia

The formation of waste market in Georgia started in 1990s. In the initial stage, the waste sector was busy with collection and export of ferrous and non-ferrous metals. There was no waste recycling and their use as secondary raw materials. In the initial stage of formation, the waste market was chaotic and disorganized, in which illegal and, often, criminal activities exceeded legal operations. However, the fact is noteworthy that it was exactly waste sector, which became often the only means for subsistence and source of employment for the population at the

verge of humanitarian catastrophe brought about by economic collapse of the country. The scrap of ferrous and non-ferrous metals, secondary raw materials and the product produced from it remains the dominant export commodity of Georgia even today. During the last ten years the formation of ferrous and non-ferrous waste management sector has taken place and been established. The sector is currently well-adjusted and organized. In Georgia, the wide network of scrap collectors is active; the prices on metal wastes react to the demands of the international market of secondary



metal. It can be said that the metal waste sector is well-integrated into the world economic chain.

Since 2003-2004, the waste recycling enterprises started functioning together with the increase of economic activity in the country. Such products as glass, carton, and plastic started appearing on the waste market. In the initial stage, the market was basically oriented towards the demands of local recycling ventures. Because of unstable and little demand for the product, the market was of disorganized nature. Since 2007-2008, this sector of waste market manages to integrate with international waste market, which has facilitated rapid increase in market volume and its formation process. In parallel to the increase of the demand on secondary resources, the prices of waste also increase. In spite of dynamic growth of waste sector (glass, paper, carton, plastic), the market is still in the stage of formation. The formalization of the waste market will make

possible significant growth of the waste sector and better integration into the global trade of wastes.

Market price of wastes		
	unit	lari/unit
ferrous metal	kilogram	(0,2 -0,4)
copper	kilogram	(4 - 7)
aluminum	kilogram	(1- 2)
glass	ton	( 90 - 98)
plastic	kilogram	( 0,2 -0,3)
Plastic bottles	kilogram	( 0,5 -0,6)
carton	ton	(100 -150)
paper	ton	(200 - 250)

Source: Research of recycling ventures

## RECYCLING SECTOR

The labor carried out in the recycling sector contributes significantly to overcoming simultaneously several environmental problems (such as mitigation of climate change impact or pollution prevention). Recycling sector is one of the most significant sectors from the standpoint of creation of new economic markets and workplaces. The poorest stratum of population and the least qualified workforce is employed in waste collection and recycling sector, making special contribution to the cause of overcoming poverty and improving standard of living.

In spite of the fact that recycling is presented in a separate chapter in NACE, on which industrial

register of national statistics is based, the existing economic policy does not consider recycling as economic activity of special importance. Recycling is considered as a usual, profit-oriented business activity and environmental and social benefits of this sector are not assessed. Correspondingly, identification of enterprises according to recycling and running of precise register does not take place.

So far there has been neither statistical, nor analytical study of recycling sector in Georgia. Correspondingly, there is no systematic information regarding this sector. Within the framework of “Clean up Georgia” project it was managed to study the activities of existing enterprises in the recycling

sector as well as assessment analysis of the waste market. The research enabled us to complete more or less the information regarding the sector (Annex 1) (this annex should contain the register of those enterprisers, whom the research concerned, sorted in accordance with regions and activities).

In Georgia, municipal waste recycling sector is

Distribution of recycled wastes		
Naming of wastes by categories	ton/year	%
metal	120 000	95,4
glass	4 994	4,0
plastic	182	0,1
carton	200	0,2
paper	370	0,3
total:	125 746	100

Source: Research of recycling ventures

mainly represented by ferrous metal recycling, which occupies 95.4% of the sector. Glass recycling makes 4%, while other wastes together (non-ferrous metals, plastic, paper, carton) constitute 0.6%.

Recycling sector requires significant changes with regard to its formalization and greening. Proceeding from the type and source of generation of wastes, it is necessary to classify the wastes in detail and, correspondingly, identify the standards

of secondary raw material or product obtained from them. At the same time, collection and treatment of different kinds and types of wastes requires the elaboration of different approaches and strategies. For the development of recycling, it is vitally important to formalize and structure the waste market, create the environment for free trade and free competition, make innovations and modern technologies accessible.

### Structure of recycling (treatment) of solid municipal wastes

country/region	municipal waste produced 1 kg per capita	total of municipal waste treatment 1 kg per capita	treatment of municipal wastes %			
			disposed at the landfill	incineration	recycling	composting
Georgia	236, 3	200,8	86	0	14	0
EU27	513	504	38	20	24	18

Environment in the EU27 Recycling accounted for a quarter of total municipal waste treated in 2009.

In Georgia, comparison of the condition of municipal waste treatment with average European figure indicates at extremely low figure of the “greening” of the sector. Waste incineration and composting does not occur. At the same time, if we take into account that 95.4% of the volume of recycled waste comes only on the recycling (treatment) of ferrous metals, it will be proved that, in reality, the share of other municipal waste recycling (treatment) is less than 1%.

In Georgia, both secondary raw material and new product is obtained from wastes (ferrous metal, glass, paper, carton, polyethylene, etc.).

### RECYCLING (PROCESSING) OF FERROUS METALS

In Georgia there are two enterprises “Rustavi Steel” and “Georgian Steel” engaged in ferrous metal recycling. Both enterprises are leaders of the Georgia heavy industry. The enterprises are manufacturing products from secondary raw metal material, which they are manufacturing from the scrap purchased at the local market (waste of ferrous metal). The enterprises are mainly manufacturing high quality different types of

construction steel twigs out of ferrous metal raw material which go both to the local and neighboring countries markets. Metallurgical enterprises annually jointly process 100-150 thousand tons of ferrous metal scrap. Due to the absence of the wastes movement statistical registry and wastes sources observation, it is impossible to define the share of solid municipal waste or other, namely, construction or industrial waste source in the recycled metal scrap.

According to the information available for us the ferrous metal scrap processing structure is the following.

In total the share of processed ferrous metal scrap in recycling constitutes 41, 5 %, which is a rather high indicator and is approximated to the average recycling European indicator. It should also be noted that rather big amount of metal waste end up at landfills; about 8% of the whole waste which points at the low efficiency of waste collection existing practice. Introduction of separation (sorting) system will significantly reduce the occurrence of ferrous metal; waste at landfills and diffusion in the environment. Such structure of metal waste processing is caused by the existence in the country of large metallurgical industry tradition. Also, by the changed attitude of the

## Ferrous metal scrap processing structure

Thousand tons/per year

<b>Exported</b>	146	50,5%
<b>Recycled (processed)</b>	120	41,5%
<b>Disposed at landfill</b>	23	8%
<b>Processed total</b>	289	100%

(Information source: National Service of Statistics; Gamma, Scientific-research Company, Feasibility study Project of solid household wastes polygon construction and operation, Tbilisi 2010, Study of recycling enterprises)

society towards the metal wastes; namely, there is firmly inculcated idea that metal waste is a secondary resource which has actual market price and not garbage which should be got rid of by any means.

Local ferrous metal waste market is able to completely satisfy the recycling enterprises' demand on the raw material even in case of demand's growth by 200-250%.

Ferrous metal recycling enterprises operate at 20-30% of their designed capacity naming high credit interests of the banks being the main cause for it and metal processing obsolete technologies. The enterprises, in case of introduction of modern technologies, assume the recycling volume growth by 300-400% and the growth of production efficiency (enterprise expenses on one unit of product) by 20%.

Ferrous metal waste recycling sector significantly contributes to the country economy, also in the environmental protection and employment fields; however, it is still very far from being "green". Recycling enterprises are metallurgical plants of average volume which do not seriously take into account environmental standards and regulations during the industrial processes management, and employment based on dignified labor principles.

### NECESSARY CHANGES FOR FERROUS METAL RECYCLING SECTOR "GREENING"

Ferrous metal wastes market and recycling is rather well developed if compared with other sectors of wastes recycling (processing), although the sector needs significant changes for its strengthening and "greening".

1. *Introduction of ferrous metal wastes accounting system;*

Absence of statistical information on the wastes sources and their movement makes it impossible to develop wastes management strategies and policy, introduction of regulating instruments, carrying out studies and monitoring. In addition, the planning of the recycling business and revealing new markets and development possibilities are limited.

2. *Classification and standardization of ferrous metal wastes;*

Wastes classification will enable ferrous metal wastes market to make the product diverse and create new possibilities for the production of recycled products. In addition, it will make it possible to regulate the quality standard of the secondary raw material which would significantly increase the competitiveness of the recycling sector product at the local and international market.

3. *Formation of municipal ferrous metal separation system;*

Formation of separation system will facilitate to the ferrous metal municipal wastes segregation and will reduce their occurrence at landfills and diffusion in the environment. Separation will tangibly increase the wastes market volume and facilitate to its formalization. Formalization and formation of separation and structured system will make it possible to ensure dignified labor conditions and labor rights for employed and self-engaged in this sector people. At the same time, it will be possible to improve their qualification, educate and train them.

4. *Arrangement of municipal ferrous metal wastes segregation (collection) sites according to environmental regulations and standards.*

Ferrous metal wastes' unarranged segregation sites represent the sources of contamination. They, as a rule, are located close to the settled

areas creating high risk for the pollution of environment and human health.

### 5. Formalization and structuring of ferrous metal wastes market.

Formalization and structuring of ferrous metal wastes market will facilitate to the free trade with wastes and growth of competition, legalization of trade; expansion of wastes market and its diversification, joining the global network of trade with ferrous metal wastes, which in its turn would increase the wastes cost and would invoke the demand on new market products. Diverse and standardized market would invoke new possibilities for the recycling business.

6. *Introduction of environmental regulations and standards at ferrous metals recycling enterprises;* Introduction of environmental regulations (for example carrying out environmental impact procedures, carrying out environmental audit) would make the enterprises more stable and attractive for investments.

7. *Financial and technical support of ferrous metal wastes recycling (collection) enterprises for the introduction of new technologies and innovations;*

Enterprises are in need of technical renovation in order to produce competitive and high quality product which in its turn will increase the volume of the recycled (collected) by them wastes.

## RECYCLING (COLLECTION) OF NONFERROUS METALS

The market of nonferrous metal wastes is rather voluminous and dynamically growing. There is operating a wide network of nonferrous metal municipal wastes collectors. Information on the recycling of nonferrous metal wastes is rather scanty. The sector of nonferrous metal recycling is occupied only with the production of secondary raw. Collected nonferrous metal wastes are fully exported either without recycling or as a secondary raw material. The export constitutes 7 430 tons per year.

Due to the fact that there is not carried out any statistical registry of wastes movement and observation of the wastes sources, it is impossible to define the share of the solid municipal wastes in nonferrous metal wastes. Neither there is available information concerning the nonferrous metal wastes disposed at landfills.

Recycling of nonferrous metal wastes in Georgia actually is not taking place, although according to the volume of nonferrous metal secondary raw material and exported scrap, our assumption is that in case of efficient operation of its collection and separation system, the volume of generated and collected nonferrous metal wastes would provide enough resources for the development of recycling sector.

## NECESSARY CHANGES FOR GREENING OF NON-FERROUS METAL RECYCLING SECTOR

Nonferrous metal wastes collection system and market is rather developed, which we cannot say

about its recycling. The sector needs significant changes for its strengthening and “greening”.

1. *Introduction of nonferrous metal wastes accounting system;*

Absence of statistical information on the wastes sources and their movement makes it impossible to develop wastes management strategies and policy, introduction of regulating instruments, carrying out studies and monitoring. In addition, the planning of the recycling business and identifying new markets and development possibilities is limited.

2. *Classification and standardization of nonferrous metal wastes;*

Wastes classification will enable nonferrous metal wastes market to make the product diverse and create new possibilities for the manufacture of recycled products. In addition, will make it possible to regulate the quality standard of the secondary raw material which would significantly increase the competitiveness of the recycling sector product at the local and international market.

3. *Formation of municipal nonferrous metal separation system;*

Formation of separation system will facilitate to the nonferrous metal municipal wastes segregation and will reduce their occurrence at landfills and diffusion in the environment. Separation will tangibly increase the wastes





deficit and cannot satisfy the demands of recycling enterprise on the secondary raw material. To fill the shortage the enterprise is obliged to use the primary raw material, which is obtained from Sachkhere sandpit.

The use of the primary raw material increases the cost price of the product by 40-50%, as well as enterprise's cycle and energy consumption. Because of the scarcity of the information it is impossible to evaluate the damage caused by the non-green economic activity to the enterprise, natural and social environment.

The enterprise operates at 80% of its designed capacity, although in case of the development of the glass wastes market it would be able to double the production volume.

The enterprise considers that the main bottlenecks for the recycling development are the following:

- a) Imperfect legislative regulations and
- b) Absence of the glass wastes separation system.

The glass recycling sector is still in the stage of formation and needs a lot of changes to be carried out for its "greening", namely:

- a) Development of glass wastes market and wastes management system,
- b) Introduction of environmental standards and regulations during the industrial process and
- c) Employment which will be based on dignified labor principles.

Glass waste collection system and market are poorly developed which cannot be said about recycling. The sector needs significant changes for its strengthening and "greening".

## NECESSARY CHANGED FOR THE GLASS RECYCLING SECTOR GREENING

1. *Formation system of municipal glass wastes separation;*

Formation of separation system will facilitate to glass municipal wastes segregation and reduce their occurrence at landfills and diffusion in the environment. Separation will tangibly increase the wastes market volume and will facilitate to its formalization. Formalization of the separation system and structuring will make it possible to create and ensure dignified labor conditions or labor rights for the employed and self-employed people; also, their professional development, education and training.

2. *Glass wastes market formalization and structuring;*

Glass wastes market formalization and structuring will promote free trade with wastes and growth of competition, trade legalization and openness, also expansion of wastes market and diversification. Diverse and standardized market will create new possibilities for the recycling business.

3. *Introduction of environmental regulations and standards at the glass waste recycling enterprises;*

Introduction of environmental regulations and standards for glass waste recycling will make the enterprises more stable and attractive for investments; will ensure setting in dignified labor standards for employees.

4. *Financial and technical support of the glass wastes recycling enterprises for the introduction of new technologies and innovations;*

Enterprises are in need of technical renovation in order to produce competitive and high quality product which in its turn will increase the volume of the recycled by them wastes.

## CARTON RECYCLING SECTOR

In Georgia only one enterprise is engaged in carton recycling. "NeoPrint", Ltd situated in Tserovani settlement.

The enterprise annually recycles 200 tons of carton waste. The enterprise produces secondary paper which is used to make corrugated boxes for wrapping. The enterprise provides its products both

to the local and neighboring countries markets. 70 people are employed to work there.

The carton supply to the enterprise is provided from different sources: collection from population, purchasing from collecting companies, gathering from municipal landfills.

The carton market completely satisfies the recycling enterprise's demand on the secondary raw

material. The enterprise operates at 50%-80% of its designed capacity. Equipment of the enterprise is obsolete. According to the enterprise representatives in case of introducing modern technologies there, the production could be increased to 1000 tons/year and the expenses on the production of one unit could be reduced by 15%-20%.

The enterprise thinks that the main bottlenecks in the carton recycling sector are:

- a) High interest on bank credit;
- b) Imperfect legislative regulations;

- c) Absence of wastes separation system;
- d) Provision of low quality (contaminated) wastes to the carton waste market.

The main drivers for carton waste generation is wrapping carton waste the source of which are trading establishments, offices, construction and household activities. Due to the absence of relevant registry, it is impossible to evaluate the volume of carton waste and its categorization in accordance with the source of its generation.

### Carton waste recycling structure

Ton/year	Average indicator for three years	
<b>Exported</b>	4920	9,5 %
<b>Recycled</b>	200	0,4 %
<b>Disposed at a landfill</b>	46 680	90,1 %
<b>Processed total</b>	51800	100 %

(Source of information: National Service of Statistics; Gamma, Scientific-research firm, Draft Feasibility Study of Tbilisi solid household wastes polygon construction and operation, Tbilisi 2010, Study of recycling enterprises)

Carton waste processing structure shows that recycling share in the whole carton processing is insignificant (0, 4%). However, fast growth of export volume proves that carton waste market is being formed and dynamically growing. The share of carton waste disposed at landfills is high which indicates about the necessity of introducing “green” changes into carton wastes management system.

Carton recycling sector is poorly developed, although generated wrapping carton waste growth and waste market development creates possibility for the growth of recycling volume and manufacturing of new products.

### NECESSARY CHANGES FOR CARTON RECYCLING SECTOR “GREENING”

Carton wastes collection and market is well developed; however the recycling sector needs significant changes and investments for its strengthening and “greening”.

- 1) *Introduction of wrapping materials wastes accounting system;*

Absence of statistical information on the wastes sources and their movement makes it impossible to develop wastes management strategy and policy, to introduce regulation instruments, and carry out studies and monitoring. In addition, recycling business planning and revealing the

possibilities of new markets and development is limited.

- 2) *Carton wastes classification and standardization;* Wastes classification will make it possible for the carton wastes market to diversify the product and make it possible to produce recycled product. In addition, this will make it possible to regulate the quality of secondary raw material which will significantly increase the competitiveness of recycled sector products both at local and international market.

- 3) *Formation of formalized and structured system for wrapping material separation and collection;* Formation of separation and collection system will promote wrapping materials wastes segregation and will reduce their occurrence at landfills and diffusion in the environment. Separation will tangibly increase the wastes market volume and will promote its formalization. Separation and collection system formalization and structuring will make it possible to create dignified labor conditions and labor rights for the people engaged in this field, will ensure setting in dignified labor standards for employees; also, their professional development, education and training.

4) *Setting up of sites for the segregation of wrapping materials wastes in accordance to the environmental regulations and standards.*

Disorganized segregation sites for wrapping materials wastes represent the contamination sources. They, as a rule are located near the settled areas creating high risk for environment contamination and human health.

5) *Formalization and structuring of wrapping materials wastes market.*

Formalization and structuring of wrapping materials wastes market will promote free trade with wastes and growth of competitiveness, trade legalization and openness. Also the market expansion and diversification, engagement in the global network of wrapping material wastes trade in its turn will increase wastes costs and entail demand on new market products. Diverse

and standardized market will bring about new possibilities for the recycling business.

6) *Introduction of environmental regulations and standards in carton wastes recycling enterprises.*

Introduction of environmental regulations and standards will make the enterprises more stable and attractive for investments. It will ensure the inculcation of dignified labor standards for employees.

7) *Financial and technical support of carton wastes recycling enterprises for the introduction of new technologies and innovations.*

Enterprises are in need of technological renewal in order to produce competitive and high quality product which at the same time will increase the volume of the recycled by them wastes.

## PLASTIC MATERIAL RECYCLING SECTOR

Information about the enterprises engaged in the plastic material recycling in Georgia is very scarce. These are mainly small primitive (unprofessional) enterprises which out of plastic wastes produce secondary raw material and provide to the market or produce new products themselves. Most of the secondary raw materials markets are illegal because producers do not want to make it open that when manufacturing products they are using secondary raw material. Such caution of the producers is caused by:

a) Low environmental awareness of the users (they distrust the secondary plastic materials and plastic bottles quality and are not sure that they are safe for human health)

b) The cost price of the product produced from the secondary plastic material and plastic bottles is significantly low. While producers' desire is to sell the products at the price of the product manufactured from the primary raw materials.

Most of the recycling enterprises are small, primitive (unprofessional) enterprises where environmental standards and dignified labor conditions are not observed. The product is of low quality plastic material. The enterprises which have relevant qualification and possibility to expand the production and provide high-technological product manufactured from secondary raw material are not stably provided by the wastes market with relevant quality and volume of wastes.

### Plastic material wastes processing structure

Tons/year

<b>Exported</b>	789	1,6 %
<b>Recycled</b>	182	0,4 %
<b>Disposed at a landfill</b>	46 680	98 %
<b>Processed total</b>	47651	100%

(Source of information: National Service of Statistics; Gamma, Scientific-research firm, Draft Feasibility Study of Tbilisi solid household wastes polygon construction and operation, Tbilisi 2010, Study of recycling enterprises)



In processing the plastic materials and plastic bottles the share of recycling is insignificant. The more detailed study of the sector might reveal additional recycled wastes certain amount; however this will not exceed 1%. Under the conditions of very scarce information we have got, it could be stated that currently the share of recycling in the whole processing fluctuates between 1%, which in the end does not change the state existing in the plastic material and plastic bottles sector. As the table shows, the most part of the plastic waste (98%) is disposed at landfills. In this field too, the waste management system and approaches demand significant changes with regard to “greening”.

Plastic material and plastic bottles wastes market is in the formation process, although it satisfies the demand of recycling enterprises on the raw material.

The main obstacles for the development of recycling sector according to the enterprises are the following:

- a) Absence of separation system;
- b) Absence of statistical information on the movement of wastes;
- c) Chaotic wastes market.

Product manufactured in the sector goes only to the local market which significantly limits expansion of the production.

### NECESSARY CHANGES FOR THE “GREENING” OF THE PLASTIC RECYCLING SECTOR

Collection of the plastic wastes and the market are still in the stage of formation. Recycling sector needs significant changes and investments for its strengthening and greening.

- 1) *Introduction of plastic wastes accounting system;*  
Absence of statistical information on the wastes sources and their movement makes it impossible to develop wastes strategies and policy; introduction of regulation instruments, carrying out research and monitoring. Also, the planning of recycling business and revealing new markets and development possibilities is limited.
- 2) *Plastic wastes classification and standardization*  
Wastes classification and standardization will enable the plastic waste market to diversify the product for sell and create new possibilities for

recycled products manufacture. Also, it will make it possible to regulate the standard of the secondary raw materials quality which will significantly increase the competitiveness of recycling sector products both at the local and international market.

- 3) *Formation of plastic separation and collection system;*

Formation of separation and collection system will promote the segregation of plastic wastes and reduce their occurrence at landfills and diffusion in the environment. Separation will tangibly increase the wastes market volume and will facilitate to its formalization. Formalization and structuring of separation and collection system will make it possible that in this field the employees and self-employees have dignified labor conditions and their labor rights are ensured. Also, it will promote their professional development, education and training.

- 4) *Formalizing and structuring of plastic material market.*

Formalizing and structuring of plastic wastes market will promote free trade of wastes and competition growth, trade legalization and openness; expansion of wastes market and diversification of plastic wastes trade in global network, which in its turn will entail the growth of wastes price and demand on new market products. Diverse and standardized market will bring about new possibilities for recycling business.

- 5) *Introduction of environmental regulations and standards in the plastic recycling enterprises.*

Introduction of environmental regulations and standards will make the enterprises more stable and attractive for investments. It will ensure the inculcation of dignified labor standards for employees.

- 6) *Financial and technical support of plastic wastes recycling enterprises for the introduction of new technologies and innovations.*

Enterprises need technological renewal in order to produce competitive and high quality product, which will, at the same time, increase the volume of the recycled wastes.

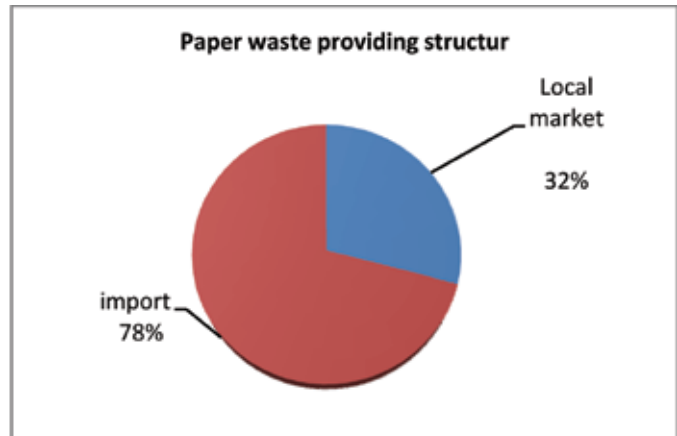
## PAPER RECYCLING SECTOR

Paper recycling in Georgia does not have a long history. The first primitive enterprises became functional in 2000 which were collecting and recycling paper from publishing houses, offices and population. Out of paper secondary raw material they were mainly manufacturing low quality toilet paper. In 2004-2005 there started the formation of paper waste market. Business establishments whose work was generating paper waste (publishing houses, printing houses, offices) considered it as garbage which should be got rid of and paid money for their disposal at landfills or burned it if the State environmental regulations did not make any obstacles to it. Formation of paper waste market and emergence of market demand on it changed the attitude towards the paper waste. Currently, the business considers the generated paper waste as a secondary raw material and tries to sell it as beneficially as possible. Along with the growth of the market and its formation the price of the paper waste grew as well, currently its price being over 250 GEL per ton. Formation of paper waste market and integration with the wastes international markets will promote the further expansion of the recycling sector and growth of price of the secondary resource. Thus, inclusion of the paper waste as a secondary raw material into economic cycle entailed its transformation from economic activity burden into the source of additional income, reduction of environmental impact, source of employment and well-being.

Paper waste market is in deficit. The market partly satisfies the demand of recycling enterprises on the secondary raw material. The filling of the deficit is carried out through the paper waste import.

At the local consumer market the demand on the product manufactured through the recycling of paper has sharply increased which relevantly was reflected on the growth of the waste import.

paper waste local market provides to the recycling sector 370 tons of paper for recycling every year which satisfies the demand on paper waste by 32%.



Source: National Service of Statistics; Study of recycling enterprises.

### Paper waste processing structure

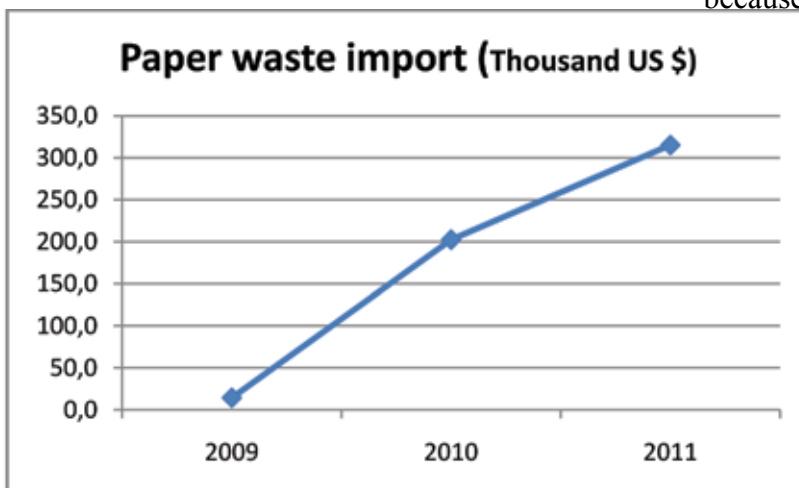
#### Tons/year

Recycled	370	0,8 %
Disposed at landfills	46680	99,2 %
Processed total	47050	100 %

Technical equipment of the most of functioning enterprises in the paper recycling sector is primitive or obsolete. Despite their low production capacity, because of the deficit of the raw material at the

paper waste market, the enterprises manage to operate at 50%-80% of their designed capacity.

Under the conditions of obsolete technologies and unsatisfactory investment and business environment, the local recycling sector has difficulties to provide high quality, competitive products to the consumer market. The local products at the consumer market is occupying low quality and cheap hygiene paper niche.



Source: National Service of Statistics (import, 4707, paper and carton, regenerated from paper waste and paper for recycling)



considered that under the conditions of economic activity the environmental impact caused by the wrapping materials is minimal and is subject to self-regulation. Relevantly, there is not conducted any registry and monitoring of wrapping materials sources and movement. Due to the absence of estimating studies and analytical information, actually it is impossible to make any assessment on the generation sources of wrapping materials, its growth dynamics, its diversity or movement. It is possible only to speak about the state of this sector and its impact only via indirect observation.

The growth of volume of the wrapping materials has been reflected on the carton waste market dynamics and sharply increased carton waste import during the last three years. This in its turn creates new possibilities for the development of carton recycling. As for polyethylene wrapping

material, it is completely disposed at landfills. Scarcity of information makes it impossible to assess the volume of generated polyethylene wrapping material and its dynamics. However, the diffusion of the waste's sharp increase in the environment is clearly noticeable. Lately environmental pollution caused by polyethylene wrapping material causes the public concern. The State policy looks to the settling of this problem by the "At the end of the pipe" principle, namely, is limited only to the collection campaign of diffused in the environment waste and introduction of fining system. However, these measures do not bring about any tangible effects.

Wrapping materials management sector needs significant "greening" changes, reduction of wrapping materials generation and development of wastes handling unified strategy and market stimulation.

## SUMMARY OF THE STUDY

The study of the recycling sector revealed the changes that should be carried out in the economic and environmental policy which would promote the strengthening of sector and its "green growth".

- The study showed that the inculcated idea as if recycling sector development is hindered by the scarcity of generated wastes and high cost of processing, is not correct and needs to be changed;
- The attitude towards wastes in economic and environmental policy as a negative burden existing along with the economic development shall be changed. It should be disposed of safely for the environment and human health. It is necessary that waste is considered as secondary raw material resource which should be included in the economic cycle;
- The attitude that waste is managed according to only one "At the end of the pipe" principle needs to be changed because such approach cannot ensure environmental impact and reduce the risks for human health;
- The state we have in waste management is dramatic and needs urgent actions (measures) for its formation. There is not a unified policy or Action Plan for waste management. The present legislative base is poor needing improvement. Due to lack of qualified personnel and finances the work of the institutional structures is

problematic. There is still continuing irrelevant disposal of wastes (at so called "chaotic" (spontaneous) landfills).

- Municipal wastes registry system needs to be changed. The existing system does not allow assessing the actual cost of waste management. In order to develop effective "greening" programs for municipal wastes it is necessary to introduce Full Cost Accounting for Municipal Solid Waste Management;
- The main determining factor for recycling sector development are formalized and structured waste markets which needs waste registry, classification and standardization of secondary raw material and product.

Facilitating legislative and tax regulations are necessary for wastes collection and recycling. For the stability of wastes market and recycling sector, proceeding from their social and ecological significance, it is necessary that legislative regulations and economic incentives are enforced. It shall be taken into account that there is not one unified (universal) scheme for all problems. Regulations and economic incentives may vary according to the type of waste and matched with the certain region conditions and demands. The attitude of the society to the recycled products and wastes needs changing. Public awareness raising is one of the preconditions for waste sector "greening" and recycling development.



**BIBLIOGRAPHY (References)**

1. Global Green New Deal”. Policy brief. United Nations Environment Programme. March 2009.
2. OECD (2011a), Green growth strategy Synthesis Report [www.oecd.org/greengrowth](http://www.oecd.org/greengrowth)
3. Full Cost Accounting for Municipal Solid Waste Management, United States Environmental Protection Agency, Solid Waste and Emergency Response 5305W
4. Global Green New Deal”. Policy brief. United Nations Environment Programme. March 2009. [www.unep.org/pdf/A\\_Global\\_Green\\_New\\_Deal\\_Policy\\_Brief.pdf](http://www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf)
5. Green Business Support Strategy For Georgian Private Business Organizations And Employers Associations, Developed by: Zaal Lomtadze, Nato Kirvalidze; Tbilisi, 2011
6. GEO- ქალაქი თბილისი: საქართველოს დედაქალაქის მდგომარეობის და ტენდენციების ინტეგრირებული გარემოსდაცვითი შეფასება (2011)
7. UN ECE, ENVIRONMENTAL PERFORMANCE REVIEWS GEORGIA, Second Review, ECE/CEP/157, New York and Geneva, 2010
8. From waste to resource: an abstract of world waste survey 2009, philippe chalmin, catherine gaillochet
9. UNEP, 2011, Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, [http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger\\_f.inal\\_dec\\_2011/Green%20EconomyReport\\_Final\\_Dec2011.pdf](http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger_f.inal_dec_2011/Green%20EconomyReport_Final_Dec2011.pdf)

## CONTENTS

Introduction . . . . .	3
Greening of waste sector . . . . .	3
Waste management, institutional basis and regulation mechanisms . . . . .	4
Solid municipal wastes . . . . .	4
Structure of municipal wastes . . . . .	5
Waste market . . . . .	6
Recycling sector . . . . .	9
Ferrous metal recycling . . . . .	10
Non-ferrous metal recycling . . . . .	12
Glass recycling . . . . .	13
Plastic recycling . . . . .	14
Paper recycling . . . . .	15
Package material waste sources and movement . . . . .	19
Research summary . . . . .	20
Bibliography . . . . .	21





The project “Clean-Up Georgia –Raising of public awareness and involvement in solid waste management improvement in Georgia” is carried out by the NGO consortium Greens Movement of Georgia/Friends of the Earth – Georgia and Ecovision – Union for Sustainable Development.



There are seven types of plastics that are commonly recycled and these plastics have their marks for easier separation.



Plastic labels are:

1. PET or PETE (Polyethylene Terephthalate) – bottles of soft drinks, beer, water, packaging for food ...
  2. PE-HD or HDPE (High Density Polyethylene) – bottles for household chemicals, various cans and barrels, bottles of shampoo, crates of beer and wine, toys..
  3. PVC or V (Polyvinyl Chloride) – doors and windows, moldings, sewer pipes, cable insulation, bottles for chemistry ...
  4. PE-LD or LDPE (Low Density Polyethylene) – a variety of bottles, wraps of bottles, garbage bags..
  5. PP (Polypropylene) – home plastics (tables, chairs, boxes, cans ...), palette ...
  6. PS (Polystyrene) – plastic kitchen utensils, household appliances, boxes for the disks ...
  7. Other plastics (ABS, PA etc.). – computer cases, parts in the automotive industry, baby bottles..
- Number 7 plastics that are made from polycarbonate are a source of the dangerous toxin BPA (bisphenol-A). Avoid using them.



The project “Clean-Up Georgia – Raising of public awareness and involvement in solid waste management improvement in Georgia” is carried out by the financial support of Swedish International Development Agency (Sida)



The project “Clean-Up Georgia – Raising of public awareness and involvement in solid waste management improvement in Georgia” is carried out by the assistance of the Ministry of Environment Protection of Georgia

The report has been prepared by: **Pavle Cagareishvili**

Designed by: **Irakli Guledani**

**The Greens Movement of Georgia / Friends of the Earth Georgia**

**10a Nutsubidze str. Flat-6, Floor-4th, Tbilisi 0177, Georgia**

**Tel/Fax: (+995 32) 2399543; E-mail: [info@greens.ge](mailto:info@greens.ge)**

**URL: [www.greens.ge](http://www.greens.ge) [www.cleanup.ge](http://www.cleanup.ge) [www.ecovision.ge](http://www.ecovision.ge)**