EU ENPI East – Waste Governance

Waste Management in Kvemo Kartli Region

STRATEGY

A project implemented by the Eptisa Led Consortium
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The European Neighbourhood and Partnership Instrument – Waste Governance Project

The **European Neighbourhood Policy (ENP)** was developed in 2004, with the objective of avoiding the emergence of new dividing lines between the enlarged EU and its neighbours, and instead strengthening the prosperity, stability, and security of all concerned. The ENP goes beyond existing relationships to offer a deeper political relationship and economic integration. The level of ambition of the relationship will depend on the extent to which these values are shared. The ENP remains distinct from the process of enlargement although it does not prejudge, for European neighbours, how their relationship with the EU may develop in future, in accordance with Treaty provisions.

Until 31 December 2006, EC assistance to the countries of the European Neighbourhood Policy was provided under various geographical programmes, including Tacis - for the EU's eastern neighbours and Russia – and MEDA for the EU's southern neighbours. From 1 January 2007 onwards, as part of the reform of EC assistance instruments, MEDA and TACIS have been replaced by a single instrument – the **European Neighbourhood and Partnership Instrument (ENPI)**. This is a much more flexible, policy-driven instrument. It is designed to target sustainable development and approximation to EU policies and standards - supporting the agreed priorities within the Partner Countries. For 2007-2013, approximately €12 billion in EC funding is available to support these partners' reforms.

The "Waste Governance Project" has been developed and implemented within the ENPI "eastern" region, which includes **Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia** and **Ukraine**. The specific objective of the project in each country is to:

To improve the management of waste by promoting higher standards at waste facilities, more effective waste prevention initiatives, increased capacities for waste collection and sorting, as well as increasing reuse, recovery, and safe disposal of waste.

Among other requirements, the project defines that achievement of this objective includes the preparation of a 15 year waste management strategy for a pilot region in each country.

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DEFINITIONS AND ACRONYMS

DEFINITIONS

Buy-Back Depot (for recyclable materials)	A location in which money is paid on a weight or other basis to people who bring recyclable materials
Extended Producer Responsibility	A policy approach to spreading the cost of waste management by legally designating "producers" (and including importers and distributors) as responsible for the management of their products when they are discarded
Municipal Solid Waste	Garbage, refuse, sludge, rubbish, debris, litter and other discarded non-hazardous materials resulting from residential, commercial, institutional and industrial activities

ACRONYMS

CG	Consultative Group
ENPI	European Neighbourhood and Partnership Instrument
EBRD	European Bank for Reconstruction and Development
PIU	Project Implementation Unit

1 INTRODUCTION

1.1 Purpose

The purpose of this document is to present a strategic action plan for waste management in Kvemo Kartli. It is intended that the document will become the basis for: (i) the institutional and, as necessary, legal amendments that are necessary to achieve an environmentally safe and financially affordable waste management system in accordance with modern waste management standards; and (ii) international and/or local financing to support implementation of the strategy.

1.2 Scope

1.2.1 Geographic Scope

The geographic scope of this document includes all of the Kvemo Kartli Region, and including all the communities that comprise the municipalities of Kvemo Kartli: Bolnisi, Gardabani, Dmanisi, Tetritskaro, Marneuli, Tsalka and the City of Rustavi. However, agreements have been finalized through the European Bank for Reconstruction and Development (EBRD) for waste management investments to serve the city of Rustavi and the community of Gardabani. Therefore the geographic scope of this document with respect to waste management investment includes the remaining municipalities and communities: Bolnisi, Dmanisi, Tetritskaro, Marneuli and Tsalka, and the communities in Gardabani that will not be served by the investments developed through the EBRD.

1.2.2 Technical Scope

The technical scope of this document extends to all solid waste generated within Bolnisi, Dmanisi, Tetritskaro, Marneuli and Tsalka, and the communities in Gardabani that will not be served by the investments developed through the EBRD. The focus of this document, however, is on municipal solid waste.

1.2.3 Scope of Actions

The scope of the actions that are recommended in this document extends to all aspects of implementation of a new solid waste management system including: (i) waste storage and collection; (ii) reutilisation and treatment of waste; (iii) disposal of waste; (iv) closure of existing disposal sites; (v) institutional arrangements to ensure effective waste management; (vi) financial arrangements to ensure the affordability and cost recovery necessary to support the new waste management system and (vii) identification of the tasks and timing necessary to implement the recommended waste management system, together with the identification of the responsibilities of entities for implementing the tasks.

1.3 Development of Recommendations

1.3.1 Why Focus on Kvemo Kartli

The Terms of Reference for the ENPI East Waste Governance Project identify that the preparation of a 15 year waste management strategy will be undertaken for a pilot region in each project country, and that the Project Partner in each country will identify the pilot region.
The project team has identified factors that the Project Partner may wish to take into consideration in selecting the pilot region. The Project Partner in Georgia has selected Kvemo Kartli.

1.3.2 Procedure for Development of Recommendations

The Project Partner for the ENPI East Waste Governance Project in Georgia is the Ministry of Environment, represented by a National Coordinator. In order to ensure that the waste management strategy meets the needs of the stakeholders, a Consultative Group (CG) has been established. The membership of the CG has included relevant national and local stakeholders, including a representative from each of Bolnisi, Dmanisi, Tetritskaro, Marneuli and Tsalka. The CG has been chaired by the National Coordinator. The functions of the Consultative Group have included: (i) advising the consulting team regarding all aspects of the development of the waste management strategy; (ii) facilitating the work of the consulting team; and (iii) reviewing the documents developed by the consulting team and responding to them.

The waste management strategy for Kvemo Kartli has been developed based on a series of documents prepared by the consulting team in 2010/11. These documents have included a "baseline data" document, an inventory of waste disposal sites in the municipalities of Kvemo Kartli that are a focus for investment purposes; an "Options for Waste Management" report, an "Institutional Analysis" report and a "Financial Analysis" report, accompanied by a financial model. Data and information from the first two of these documents has been used in the preparation of the latter three documents. All documents have been reviewed by, and agreed with, the CG.

In addition, capacity building sessions have been held with the CG members before the presentation of recommendations in order to ensure that the context of data/information, the analytic methodologies and the criteria used to develop recommendations are understood.

1.4 Format

The context and current waste management situation is briefly presented in Section 2. The Strategy for Waste Management in Kvemo Kartli is presented in Section 3. The Strategic Action Plan for Implementation comprises in Section 4. Background data and analyses are presented in the Annexes.

2 CURRENT SITUATION AND KEY ISSUES

2.1 Environmental and Socio-Economic Background

Figure 1 shows the Kvemo Kartli region and its municipal divisions. The region is characterized by flat plains in the east that rise to 3000m in the west. Many towns and villages in the west of the region are located above 1000m and receive significant snow in winter. Summers are hot and dry, particularly in the east.

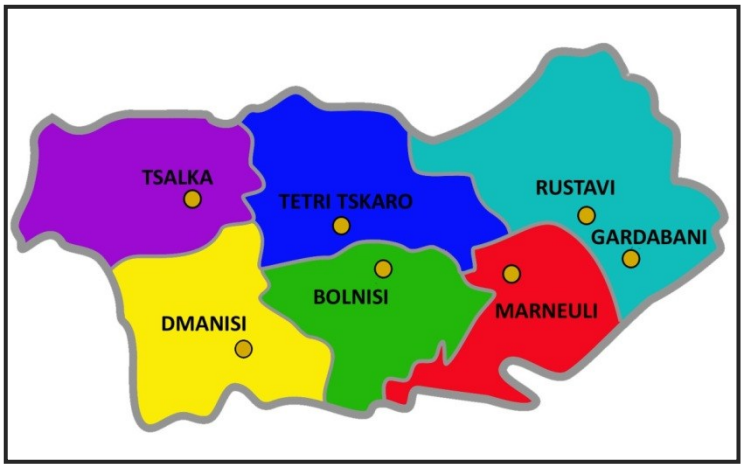


Figure 1*:* **Kvemo Kartli Region and municipal divisions**

Table 1 presents the current and projected future population of Kvemo Kartli, based on projection of population trends over the past decade by the project team.

It is assumed that economic growth in Kvemo Kartli will average 5 percent per year, a conservative rate of growth that is lower than the average of 7.5 percent rate of growth reported by the Government of Georgia in the 2003-2010 period. It is assumed that household incomes will grow at 3 percent per year.

Table 1: *Current and Projected Population of Municipalities in Kvemo Kartli*

	2011	2015	2020	2025	2030
Rustavi	119 815	121 081	122 683	124 306	125 951
Bolnisi	78 117	79 398	81 029	82 693	84 391
Gardabani	98 277	101 031	104 581	108 256	112 062
Dmanisi	28 563	28 817	29 137	29 462	29 790
Tetritskaro	28 002	29 242	30 871	32 589	34 404
Marneuli	127 248	131 111	136 105	141 291	146 674
Tsalka	22 708	23 561	24 671	25 836	27 055
Total	**502 729**	**514 241**	**529 077**	**544 433**	**560 327**

Within the municipal structure of Kvemo Kartli, there are over 350 communities. Waste management is organized and delivered by the municipalities and by the City of Rustavi.

2.2 Municipal Solid Waste Generation

Municipal solid wastes include solid wastes generated by households, plus similar wastes generated by industrial, commercial and institutional entities.

Table 2 presents projected municipal solid waste generation in Kvemo Kartli to year 2030. The projections are based on current estimates projected to future years in accordance with methodologies developed by the World Bank.

***Table 2**: Projected Municipal Solid Waste Generation, Kvemo Kartli*

	2011	2015	2020	2025	2030
Rustavi urban	41 348	44 349	48 409	52 840	57 677
Bolnisi urban	7 047	7 602	8 358	9 189	10 102
Bolnisi rural	9 370	10 108	11 113	12 218	13 432
Gardabani urban	4 835	5 275	5 883	6 560	7 315
Gardabani rural	13 685	14 932	16 651	18 568	20 706
Dmanisi urban	1 256	1 345	1 464	1 594	1 736
Dmanisi rural	4 048	4 334	4 721	5 143	5 603
Tetritskaro urban	2 657	2 945	3 350	3 811	4 335
Tetritskaro rural	3 297	3 654	4 156	4 725	5 374
Marneuli urban	10 302	11 266	12 599	14 090	15 757
Marneuli rural	15 817	17 297	19 344	21 633	24 193
Tsalka urban	1 180	1 300	1 466	1 654	1 866
Tsalka rural	3 132	3 449	3 891	4 390	4 952
Total	**117 974**	**127 857**	**141 405**	**156 415**	**173 048**

The estimated composition of municipal solid waste in Kvemo Kartli is identified in *Table 3.*

***Table 3:** Estimated Composition of Municipal Solid Waste, Kvemo Kartli*

Type of waste	Estimated Percent of Total Waste	Tonnes
Paper and cardboard	17	29,418
Plastic	10	17,305
Metal	3	5,191
Glass	7	12,113
Biodegradable	42	72,680
Other waste	21	36,340
Total	100	173,048

2.3 Management of Municipal Solid Wastes

2.3.1 Waste Storage

At present waste storage is being conducted with the equipment shown in the following table:

Table 4: *Existing Type and Number of Containers*

	0.5 tons	1.1 m3	240 l	120 l	100 l	60 l	20 l	10 l
Rustavi		400	160			100		
Gardabani		90						
Bolnisi		80	26			40		
Marneuli		150		90	30			100
Dmanisi	50	48	120					
Tetritskaro		15	400		125	170	390	
Tsalka		20			70	50		
Total	**50**	**803**	**706**	**90**	**225**	**360**	**390**	**100**

2.3.2 Waste Collection

Waste is collected within each municipality and the City of Rustavi using the number and type of collection vehicles identified in *Table 5*.

Table 5: *Existing Collection Vehicles*

	4 m3 press	4 m3 no press	5 m3 press	6 m3 no press	18 m3 press	24 m no press	tractor 2 m3	tractor 4m3	1.5 m3 sweeper
Rustavi		15			4	6			1
Gardabani	1	2							
Bolnisi		3			1	1			
Marneuli	3	3	1					1	3
Dmanisi	1			1					
Tetritskaro		3		1	1		4		
Tsalka		2		1					
Total	**5**	**28**	**1**	**3**	**6**	**7**	**4**	**1**	**4**

The percentage of the population that is covered by the waste collection service is as follows:

Rustavi	100%
Gardabani	30%
Bolnisi	35-40%
Marneuli	40-50%
Dmanisi	40%
Tetritskaro	40-50%
Tsalka	40-50%

Collection of waste from the serviced areas is being conducted on a daily basis throughout the region. During the summer months, several municipalities collect the wastes twice per day.

2.3.3 Waste Reutilization and Treatment

Small amounts of cardboard and plastics are recovered for recycling; both are sold to international markets, and plastics may also be recycled locally. One company treats a small amount of waste by composting; the quality of the compost is not known.

2.3.4 Waste Disposal

Waste is disposed of in one of 31 main waste disposal sites in Kvemo Kartli. None of these sites has any environmental controls, or modern operational standards. Two of the sites are considered to pose a high environmental and/or human health risk; a further 12 of the sites are considered to pose a medium environmental and/or human health risk. Hazardous medical wastes are disposed of in existing waste disposal sites without treatment, and other hazardous wastes may also be disposed of in these sites.

2.3.5 Financial Aspects of Waste Management

Article 121, Clause 4, of the "Law on Local Fees" defines a legal maximum fee chargeable to citizens of GEL 3 per person per month. The maximum amount for organisations is GEL 25 per m3 of waste. The actual amounts charged to households for waste management by the municipalities of Kvemo Kartli are identified in Table 6.

Table 6: *Current Waste Management Fees in Kvemo Kartli*

Municipality	GEL/person/month
Rustavi (proposed, currently 0.4)	0.60
Gardabani (proposed)	0.30 – 0.50
Marneuli	0.15
Bolnisi (proposed, currently none)	0.60 – 0.70
Dmanisi	0.15
Tetritskaro	0.50
Tsalka	0.00

Physical billing systems do not exist in all municipalities, with an obligation on residents to pay on a "voluntary" basis. Penalties can be imposed in accordance with the State Administrative Code if waste management fees are not paid, although there is no evidence of such penalties having being applied. It is estimated that in each municipality the collection rate of waste management fees from households is in the range of 40-50% of the fees that are payable; higher rates of collection are achieved from legal entities.

2.3.6 Institutional Aspects of Waste Management in Kvemo Kartli

Legal requirements for solid waste management are poorly defined and are scattered throughout different legal instruments.

A draft Framework Law on Waste is pending adoption to simplify the framework and law enforcement. This law is expected to regulate waste management according to origin as household, industrial, medical, agrochemical or biological waste.

Institutional capacities for waste management are weak. Municipalities are responsible for waste management at the local level, but technical, financial and administrative frameworks and knowledge require significant strengthening in order to support modern waste management systems.

2.3.7 Public Awareness

There is a low level of awareness in Kvemo Kartli regarding the environmental, health and economic consequences of poor waste management systems. Likewise, there is low awareness regarding options for enhanced waste management and the benefits that enhanced waste management can bring.

2.4 Key issues

Based on the analysis of the current situation, the Strategic Action Plan for Waste Management in Kvemo Kartli targets the following:

- **Institutional Strengthening** The model for enhanced waste management in Kvemo Kartli will be regionalized waste management in which municipalities optimize the efficiency of new infrastructure through sharing in the operation of that infrastructure. New institutional frameworks are required to reflect a regional waste management approach throughout Kvemo Kartli that: (i) reflects current activities in Rustavi and Gardabani; and (ii) can attract new investment to serve the sector in other municipalities in Kvemo Kartli.
- **Capacity Building** Capacity building at the local level is required in all aspects of modern solid waste management to facilitate identification/creation of new waste management opportunities and to ensure that new infrastructure is properly implemented and operated.
- **Investment and Cost Recovery** Environmentally sound solid waste management in Kvemo Kartli requires appropriate investment in solid waste storage, collection, recycling/treatment and disposal infrastructure. Appropriate tariff and cost recovery structures are required too ensure that the costs of strategy implementation can be properly paid for.
- **Public Awareness** Enhancements in solid waste management will incur new costs, and measures are required to enhance public awareness regarding waste management in order to ensure that there is public willingness to pay higher waste management fees.

- **Closure of Existing Waste Disposal Sites** Existing waste disposal sites threaten public health and the environment, and should be closed as soon as possible and beginning with the most damaging sites.

Implementation of the above measures must be undertaken in the context of the affordability of measures to enhance waste management at the local level.

The strategy for introduction of a modern solid waste management system in Kvemo Kartli will be facilitated through national actions to adopt an appropriate Framework Law on Waste Management, and through the introduction at the national level of “extended producer responsibility” for management of discarded products.

3 STRATEGY FOR WASTE MANAGEMENT IN KVEMO KARTLI

3.1 Preferred System Options

Table 7 identifies the preferred options for technology and institutional components to be implemented through the Strategy for Waste Management in Kvemo Kartli. In each case, the objective to be achieved is identified, options that have been assessed are shown and the recommended option and the related rationale are indicated.

Implementation of the recommendations identified in Table 7 will result in:

Adequate and standardized storage containers for waste in urban and rural areas of Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka

- Adequate and standardized containers and buy back depots for the collection of glass, metal, plastics and cardboard for recycling
- Collection of waste and – separately – collection of recyclable materials from throughout the municipalities of Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka including urban and rural areas.
- Delivery of waste and – separately – recyclable materials to transfer stations to be located in or immediately adjacent to Bolnisi, Dmanisi, Tetritskaro and Tsalka. Waste and recyclable materials from Marneuli will be delivered directly to the regional landfill and processing centre.
- The long distance transportation of waste and – separately – recyclable materials from the transfer stations to the regional landfill.
- Delivery of recyclable materials generated in Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka to a new regional materials processing facility to be located in the vicinity of Marneuli.
- Delivery of waste generated in Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka to a new landfill to be located in the vicinity of Marneuli, at the same location as the regional materials processing facility.
- Delivery of waste generated in north western Gardabani (Didi Lilo, Akhalsofeli, Martkofi, Norio and Sartichala) to Tbilisi landfill, and delivery of all other waste (including recyclable materials) generated in Gardabani as well as the waste and recyclable materials generated in Rustavi to the landfill/processing facility currently under development with EBRD financing.
- Composting of green waste generated in Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka at the regional materials processing facility to be located near Marneuli and at local sites in the municipalities.
- Processing of construction waste for reutilization at local sites in the municipalities.

All existing waste disposal sites should all be closed when the new regional landfill in Marneuli begins operation. Some sites should be closed immediately because of the risk they pose to human health and the environment, see *Table 8*. The costs of site closure will be borne by the municipalities, and are not included in this strategy

Table 7: *Technology and Institutional Options Recommended for Implementation*

Component: Technology System Objective: Integrated technology that can be used to deliver modern waste management services to 100 percent of Kvemo Kartli resid*ents*		
OPTIONS	**PREFERRED OPTION**	**RATIONALE**
WASTE STORAGE		
• Metal containers (0.24m ^{3}) • Eurobin-type metal containers (1.1m ^{3}) • Plastic bags • Bell-system	• All municipalities: Eurobin-type containers (1.1 m^3) • Rustavi/Gardabani: Current Bell-system, in addition to Eurobins • Mountainous villages with a population below 200 people: plastic bags or bell system instead of Eurobins	• Standardized Eurobin containers ensure proper containment of waste, are easily emptied by collection vehicles and are most cost effective. • Bell system can be cost-effective to store waste in small communities or neighbourhoods. • Plastic bags are cost effective but may not contain waste properly.
WASTE COLLECTION		
Compaction vehicles: capacities of 4 m^3 and 16 m^3	• Marneuli: 4-4m^3 and 1-16m^3 vehicle • Bolnisi: 4-4m^3 and 1-18m^3 vehicle • Dmanisi, Tsalka, Tetritskaro: 2-4m^3 vehicles in each municipality • Gardabani: 3-16m^3 vehicles • Rustavi: Existing 18 m^3 vehicles	Most cost-effective arrangements for collection of waste on a daily basis in cities and 3 times/week in villages
WASTE REUTILIZATION/TREATMENT		
• Separate containers for collection of recyclable materials • Separation of mixed materials • "Buy-back" depots • Construction waste processing • IIncineration • Mechanical-Biologgical Treatment • Composting	• Gardabani/Rustavi: Separate containers to collect glass, paper, plastic, cardboard; process in Rustavi; compost green waste in Rustavi • Marneuli, Bolnisi, Dmanisi, Tsalka, Tetriskaro: Separate containers to collect glass, paper, plastic, cardboard; process at new regional facility. Supplement with local "buy-back" depots; compost green waste at new regional facility (Marneuli, Bolnisi) and at local sites (Dmanisi, Tsalka and Tetriskaro) • Construction waste processing at new facility in each municipality	• Optimizes current recycling proposals for Gardabani/Rustavi • Optimizes new recycling activities for Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka • Provides revenues • Minimizes need for landfill
WASTE TRANSFER/DISPOSAL		
• Use of new Rustavi landfill by Rustavi and Gardabani • Construct/use new regional landfill to serve Marneuli, Bolnisi, Dmanisi, Tsalka, and Tetriskar0 • New landfills to be developed for each of Marneuli, Bolnisi, Dmanisi, Tsalka and Tetritskaro • Transfer stations to be used by Marneuli, Bolnisi, Dmanisi, Tsalka and Tetritskaro	• Rustavi/Gardabani (southern villages): Use new Rustavi landfill. • Gardabani (north western villages): Use Tbilisi landfill • Marneuli, Bolnisi, Dmanisi, Tsalka, Tetriskaro:: Use new regional landfill to be llocated in the vicinity of Marneuli • Waste/recyclable materials collected in Bolnisi, Dmanisi, Tsalka and Tetritskaro to be taken to a transfer station for long-distance transportation • Waste/recyclable materials collected in Marneuli to be transported directly to the landfill	• Optimizes current proposals for new Rustavi landfill. • Most cost-effective arrangement for Marneuli, Bolnisi, Dmanisi, Tsalka, Tetriskaro
Component: Institutional Arrangements Objective: Effective administration of regional waste management system		
OPTIONS	**PREFERRED OPTION**	**RATIONALE**
• Kvemo Kartli Region to be responsible • An "Inter-Municipal Entity" to be responsible • A "leading municipality" to be responsible • Individual municipalities to be responsible	• An "inter-municipal entity" to be responsible for waste management facilities shared by Marneuli, Bolnisi, Dmanisi, Tsalka, and Tetriskaro; Rustavi and Gardabani to be invited to join • Individual municipalities be responsible for waste collection and transportation to a transfer station/regional landfill	• Legal framework supports this option • Consistent with local self-government status of municipalities

Table 8: *Existing Waste Disposal Sites to be Closed Immediately*

Municipality	Disposal Dites
Bolnisi	Naxiduri, Savaneti near Mashavera river, Savaneti, along the canal, Talaveri, Arqevani,
Marneuli	Jandara
Rustavi	Iagluja (closure underway), Rustavi next to the cemetary, site 2 km from Iagluja
Gardabani	Sartichala, old bridge, Saakadze
Tetritskaro	Tetritskaro, dried lake

3.2 Institutional Arrangements

Implementation of the waste management system will be undertaken by an Inter-Municipal Entity, comprised of the municipalities of Marneuli, Bolnisi, Dmanisi, Tsalka, and Tetriskaro; Rustavi and Gardabani will also be invited to participate in the Inter-Municipal Entity. The Inter-Municipal Entity will be registered as a non-commercial legal entity. The purpose of the Inter-Municipal Entity will be to coordinate effective waste management in Kvemo Kartli, and in particular to implement and operate regional waste management services on behalf of Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka; as appropriate in the future, the Entity will extend the scope of these services to Rustavi and Gardabani (following their participation in the Entity). Additionally, the Entity will:

- Coordinate waste management planning on behalf of all seven municipalities
- Coordinate and deliver public awareness, capacity building and the sale of recyclable materials on behalf of Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka, and provide support for the closure/rehabilitation of waste disposal sites; these activities will be coordinated, as appropriate, with similar activities undertaken by Rustavi and Gardabani upon request.
- Coordinate and/or manage the delivery of waste collection for Bolnisi, Dmanisi, Tetritskaro and Tsalka on a fee basis, upon request.

Figure 2 illustrates these arrangements.

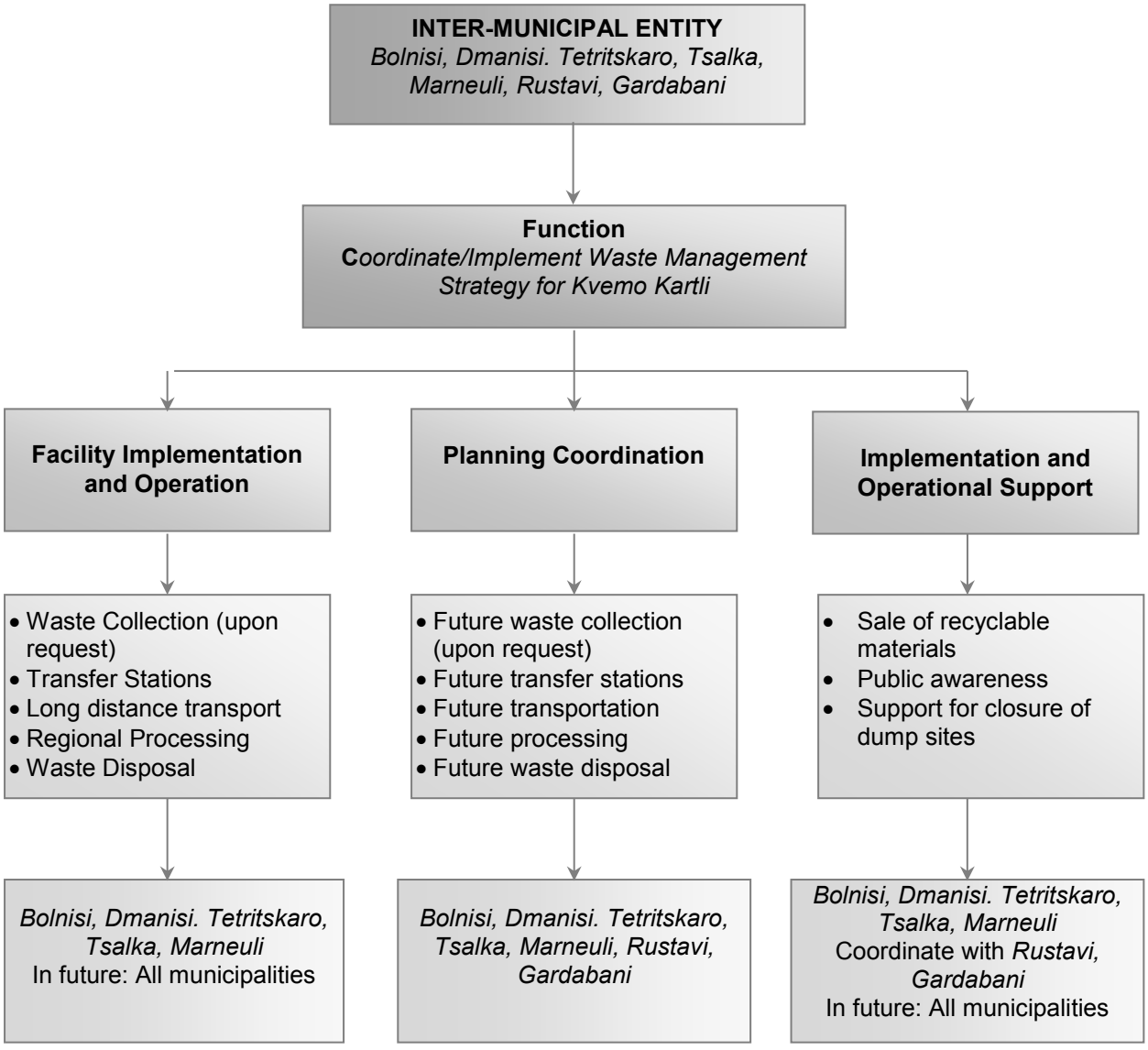
Figure 3 identifies the structure of the Inter-Municipal Entity. All elected representatives at the municipality level will participate in the General Assembly, which will set policy and approve annual budgets. The Head of each municipality (or his/her delegate) will participate on an Executive Board, which will be responsible for the execution of the work of the Entity.

Initially, the Inter-Municipal Entity will in particular organize and arrange the financing necessary to implement the waste management strategy, and will then undertake its implementation (Implementation Phase). This will be undertaken through a Project Implementation Unit (PIU), as illustrated in Figure 3.

Following the completion of implementation, the Operations Phase will start, in which regional waste management services will be delivered through an operational entity (i.e. a company) that is owned by the Inter-Municipal Entity or its members. The staff of the PIU will be transferred to the operational entity.

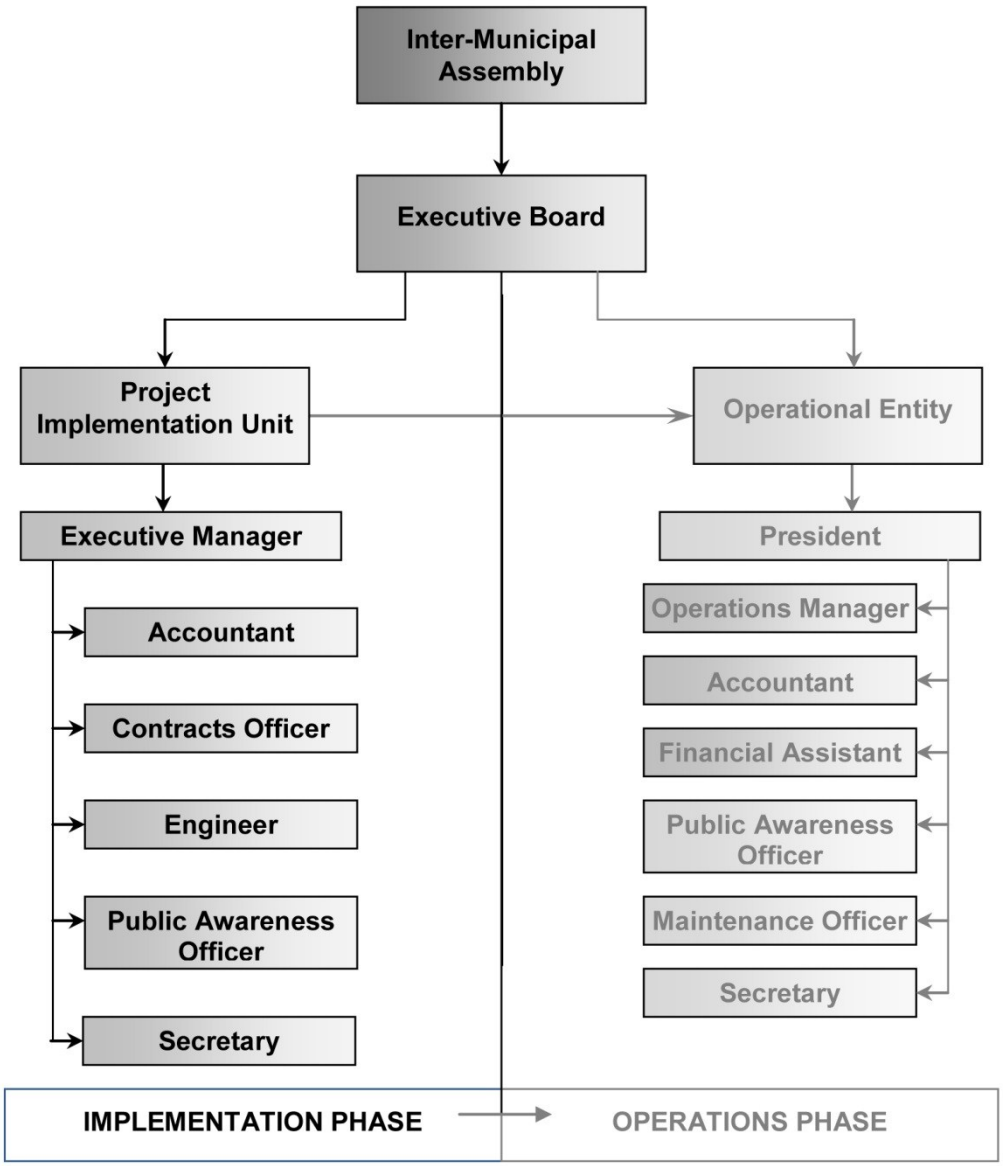
The start-up of the PIU will incur a cost of 18,000 Euro/42,500 GEL, equivalent of 0.063 Euro/0.15 GEL per person in the municipalities of Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka. The annual budget of the PIU when fully staffed will be 42,320 Euro/99,500 GEL, including salaries and office costs; this is equivalent to 0.15 Euro/0.35 GEL per person per year in the municipalities of Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka. Both of these costs can be phased in accordance with the schedule for implementing the waste management strategy. These costs will be paid by the members of the Inter—Municipal Entity.

Figure 2: *Function and Arrangements for Service Delivery by the Inter-Municipal Entity*



The set-up of the administrative and services function of the operational entity will incur an additional cost of 3,000 Euro/7,000 GEL, assuming PIU staff and equipment are transferred at no cost to the operating entity and assuming only one additional staff person is hired, as identified in *Figure 3*.

Figure 3: *Structure of the Inter-Municipal Entity*



The annual budget of the administrative and services staff of the Operational Entity identified in Figure 2, including salaries and office costs, will be 47,580 Euro/111,800 GEL per year to operate, assuming the only additional salary as compared to the PIU budget is for the maintenance supervisor. The annual budget of the administrative and services staff of the operating entity are the equivalent of 0.17 Euro/ 0.40 GEL per person/year in the municipalities of Marneuli, Bolnisi, Dmanisi, Tetritskaro and Tsalka.

3.3 Costs and Tariffs

Implementation of the preferred options identified in Table 7 will require the estimated initial investments identified in 2011 Euro, in *Table 9*. Financing for the implementation of the waste management system may be provided from internal (i.e. Georgia) sources or from international sources. For the purpose of analysis it is assumed that the cost of capital is 5%/year.

Financing arrangements may include both grace periods before loan repayment must be undertaken, and lower interest rates. The cost of land is not included in the analyses as this may be provided by the State.

Table 9: *Estimated First Year Investment Costs to Implement the Strategy*

INVESTMENT ITEM	ESTIMATED BUDGET (EURO)
WASTE STORAGE AND COLLECTION	
Storage containers and collection vehicles	2,017,000
WASTE REUTILIZATION/TREATMENT	
Separate collection (including containers and equipment)	246,600
Recyclable materials sorting plant (including works and equipment)	1,582,000
Composting plant (including works and equipment)	745,000
WASTE TRANSFER/DISPOSAL	
Transfer Stations (including works and long distance transport)	2,595,000
Disposal Site (including works and equipment)	7,300,000
Total Estimated Investment	**14,485,000**

NOTE: These estimates are made in the absence of specific sites at which required facilities would be constructed. However, these estimates are anticipated to be realistic and conservative, based on costs relevant incurred elsewhere in Georgia (e.g. landfill costs for Tbilisi and for Rustavi).

Table 10: *Estimated Costs of First Year of Operations*

Cost Item	Estimated Cost (Euro)
Operating Costs (including labor, fuel, maintenance etc.)	1,780,675
Collection	855,949
Separate collection	101,114
Recyclable materials sorting plant	199,265
Composting plant	22,000
Transfer	236,134
Disposal	366,213
Depreciation	1,696,358
Commercial Return (5% of asset value)	694,087
Sale of Recyclable Materials	(233,479)
Total Estimated First Year Cost	**3,937,640**

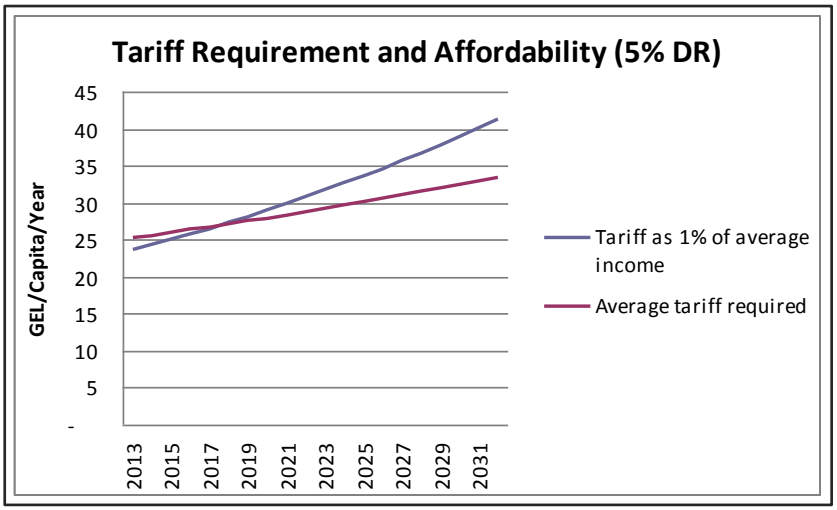
First year annual costs are shown in Table 10; annual costs will vary each year, and will reach an estimated 4,540,110 Euro by 2031.

The annual costs of the new waste management system will be paid by the users of the system: i.e. the residents of Kvemo Kartli who are served by the system, and the institutional, commercial and industrial entities that use the system for management of the wastes they generate.

The users of the waste management system will pay according to a tariff that is established in accordance with legal requirements, and specifically that a waste management tariff cannot exceed 3 GEL/person/month for household waste, or 25 GEL/m^3 for institutional, commercial or industrial waste.

An initial average tariff of 25 GEL/person/year (2.09 GEL/person/month) rising to 33 GEL/person/year (2.75 GEL/person/month) in 2031 will meet the costs of strategy implementation. Figure 4 illustrates the average tariff that will need to be charged annually to households (on a per capita basis) to meet the costs of the waste management system. Figure 4 also identifies the projected curve of 1.0 percent of household income; an average tariff of 1.0 – 1.25% of per capita income is a range that is widely accepted internationally as "affordable" for waste management services.

Figure 4: *Tariff Requirement and Affordability*



NOTE: "DR" means "discount rate", which is equal to the commercial return on asset value to the operator

As illustrated, the cost of the waste management strategy is initially slightly above 1.0 percent of per capita household income, but below 1.25 percent, and is projected to be less than 1.0 percent of per capita household income by 2018. The tariff for industrial, commercial and institutional entities will be 25 GEL/m^3 of waste. Implementation of the waste management strategy from a financial perspective is therefore considered legally feasible and financially affordable.

The collection of waste management fees from households should be linked to an existing utility, as is successfully undertaken in Tbilisi. This will allow household fees to vary in accordance with overall use of the utility service, which may serve as an indicator of household income and which may therefore result in lower waste management fees for poorer households and higher waste management fees for wealthier households. The average fee, however, will need to be calculated to be the equivalent of the average tariff identified in *Figure 4.*

Linkage of payment for waste management services with payment for another utility service brings important administrative advantages: (i) there is reduced need (or no need) to establish a new billing system, thus reducing set up costs and minimizing operational costs; and (ii) non-payment of waste management fees can be designed to trigger the cutting off of the utility service that the waste fee is linked to; this has been highly effective in Tbilisi in ensuring that waste management fees are paid by households.

3.4 Management of Other Wastes

Improvement in the management of a range of additional wastes are also targeted by this Strategy:

- **Medical Wastes**. Hospitals and health centers should design and implement systems for the segregation of hazardous and non-hazardous wastes in accordance with World Health Organization and international practice. Hazardous medical wastes should be transported to Tbilisi for management and, in future, to the hazardous medical waste treatment facilities to be located in Rustavi.
- **Dead Animals**. These will be safely disposed in a zone of the regional landfill site dedicated for this purpose, provided that these wastes are buried at least 2 meters deep and immediately covered with soil.
- **Mining Wastes.** An inventory of all tailings sites in Kvemo Kartli should be undertaken, and priority tailings sites should be identified based on their potential impact on human health, the environment and the economy. Mine operators should be required to take measures based on the application of best available technology to prevent leakage from tailings sites, and requirements in these regards should be specified on the operating licenses of the mines. Mining companies should be required to provide financial guarantees of good waste management performance in a form (e.g. a surety bond or escrow account) that allows government entities access to the money in the event that action is needed to prevent pollution from a tailings site.
- **Agricultural Wastes**. Plant wastes should be applied to the land, either directly or following treatment (e.g. to manufacture compost), or may be used to generate energy through use of appropriate technology. Old or waste pesticides/herbicides should securely store until they can be treated.
- **Hazardous Wastes**. These should be managed in accordance with law, and under no circumstances can these be allowed to enter the regional municipal waste landfill or existing local waste disposal sites. Strict enforcement of proper management of these wastes is required.

- **Wastewater Treatment Plant Sludge**. The sludge should be dried and can be used for covering mine tailings or land reclamation at closed mines.

4 STRATEGIC ACTION PLAN FOR IMPLEMENTATION

The Strategic Action Plan for Implementation is presented in Figure 5. This Figure identifies the actions that should be taken, the timing associated with the actions and the entity that is responsible for taking the actions.

The Strategic Action Plan for Implementation is built around four groups of activity:

- **Acceptance of the strategy.** This group of actions will confirm the acceptability of the strategy to the municipalities.
- **Establishment of the inter-municipal entity.** This group of actions will achieve the creation of the institutional entity that will be responsible for implementation of the strategy.
- **Pre-Identification of implementation locations.** This group of actions identifies the actions to pre-identify the locations that are preferred for the facilities necessary to implement the waste management strategy.
- **Mobilization of financing.** This group of actions will identify and access the financing necessary to implement the investments identified in the strategy.
- **Public awareness.** Continuing public awareness activities are required in support of all activities

The timing of actions that is identified in Figure 5 has been developed within the remaining time available in the ENPI East Waste Governance Project. This will allow project resources to be used in support of strategy implementation.

The following describes the specific actions will be undertaken.

4.1 Acceptance of the Strategy for Waste Management in Kvemo Kartli

4.1.1 Agreement to the Strategy

Following acceptance by of the Strategy by the Consultative Group, agreement to the strategy should be requested from each the municipalities that has participated in the Consultative Group. This agreement should be provided by an entity that represents the municipality, and should be recorded in an appropriate form. The Waste Governance Project (National Coordinator and the Project Country Coordinator) will work with municipalities to secure their agreement to the Strategy in a written format that is appropriate. Agreements from all municipalities should be obtained by the end of January 2012.

4.2 Establish Inter-Municipal Entity

4.2.1 Invite Participation of Rustavi and Gardabani

Rustavi and Gardabani have not participated in the preparation of this strategy. Nevertheless, both are part of Kvemo Kartli and although waste solutions have been developed for both municipalities there is a longer term need to ensure coordination of waste management throughout Kvemo Kartli and to achieve synergies related to capacity building, public awareness building, waste management planning and other activities.

The participation of Rustavi and Gardabani within the Inter-Municipal Entity should therefore be invited. The basis for the participation of both municipalities in the Inter-Municipal Entity will need to be agreed, recognising that their participation will be different to the other municipalities to the extent that the Inter-Municipal Entity will not concern itself with matters relating to the landfill and processing facilities used by Rustavi and Gardabani and developed with EBRD financing. The Consultative Group should adopt a resolution to invite Rustavi and Gardabani to participate in the Inter-Municipal Entity. The Waste Governance Project (National Coordinator and Project Country Coordinator) will meet with both municipalities with a view to receiving a written agreement by 29 February 2012 to participate in the Inter-Municipal Entity.

Figure 5: *Strategy Implementation*

Actions	Timing																								Responsibility
	2012												2013												
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
1. Acceptance of the Strategy																									
1.1 Agreement to the Strategy																									Municipalities
2. Establish Inter-Municipal Entity																									
2.1 Invite Participation of Rustavi and Gardabani																									Consultative Group
2.2 Prepare/Sign Inter-Municipal Agreement-In-Principle																									Consultative Group
2.3 Finalize Inter-Municipal Agreement																									Municipalities
2.4 Resolutions of Support for Inter-Municipal Agreement/Signing																									Municipalities
2.5 Hold First Meeting of Inter-Municipal Entity																									Inter-Municipal Entity
2.6 Prepare First Year Workplan of Inter-Municipal Entity																									Inter-Municipal Entity
3. Pre-Identification of Locations																									
3.1 Identify Preferred Regional Landfill Location(s)																									Waste Governance Project
3.2 Identify Preferred Transfer Station Locations																									Waste Governance Project
3.3 Identify Preferred Local Processing Locations																									Waste Governance Project
4. Mobilize Financing																									
4.1Identify Financing Opportunities																									Waste Governance Project
4.2 Prepare/Finalize Documentation																									Waste Governance Project/Other
4.3 Apply for Financing																									Inter-Municipal Entity
4.4 Implement Investments[1]																									Inter-Municipal Entity
5. Public Awareness																									
5.1 Maintain Public Awareness Actions																									WGP/Inter-Municipal Entity

NOTES

1. Precise timing of "Implement Investments" will depend on agreements with the financing entity.
2. Period of implementation will extend beyond December 2013

Dedicated activity

Intermittent activity, as appropriate

4.2.2 Prepare/Sign Inter-Municipal Agreement-in-Principle

In order to create a common understanding of the Inter-Municipal Entity a short "Agreement-in-Principle" will be developed. This document will identify the legal form the Entity will have, and will outline the key organization, governance, budget and other aspects of the proposed Entity. The document will be discussed with the municipalities and each municipality will be asked to sign their agreement with the document. The document will be an agreement of intent, but will be non-binding. The Waste Governance Project (Key Institutional Expert, Project Country Coordinator) will prepare the document on behalf of the Consultative Group. The document should be signed by 30 April 2012.

4.2.3 Finalize Inter-Municipal Agreement

A detailed Inter-Municipal Agreement will be developed based on the adopted Agreement-in-Principle. The final document will be forwarded to all municipalities and a workshop will be held with the municipalities to discuss and finalize it. The Waste Governance Project (Key Institutional Expert, Project Country Coordinator) will undertake to complete this work by 31 July 2012.

4.2.4 Resolutions of Support for Inter-Municipal Agreement/Signing

Each municipality will adopt the Inter-Municipal Agreement through a resolution of its Council. A signing ceremony will then take place that will commit the municipalities to the new Inter-Municipal Entity, and the new Entity will be registered. The Waste Governance Project (Key Institutional Expert, Project Country Coordinator) will work in close collaboration with the municipalities to arrange the logistics for completion of this action. The signing ceremony will take on or before 30 September 2012.

4.2.5 Hold First Meeting of the Inter-Municipal Entity

Immediately following the signing of the Inter-Municipal Agreement, a date will be set for the first meeting of the new Entity, and an Agenda will be prepared for the meeting. The Waste Governance Project (Key Institutional Expert and Project Country Coordinator) will assist with these tasks, as requested, and will serve as a Secretariat for the first and subsequent meetings of the Entity, as necessary until the Entity is able to provide its own support for its activities. The first meeting of the Entity will be held within 1 month of the signing of the Inter-Municipal Agreement.

4.2.6 Prepare First Year Work Plan of the Inter-Municipal Entity

A First-Year Workplan will need to be developed by the new Inter-Municipal Entity. Upon the request of the Entity, the Waste Governance Project (Key Institutional Expert and Project Country Coordinator) will draft the necessary plan, and will submit it on or before 31 December 2012.

4.3 Pre-Identification of Locations

4.3.1 Identify Preferred Regional Landfill Location(s)

The strategy identifies that the regional landfill will be located in the vicinity of Marneuli. However, it will be necessary to "pre-identify" a specific preferred location for the landfill, or a small number of preferred locations from which a specific location may be selected. The pre-identified sites will be studied in detail as part of later site specific work to confirm its suitability for use as a landfill or, if more than one location is pre-identified, later site-specific work will identify the preferred site (see "Identify Financing Opportunities", below).

This work will be undertaken by the Waste Governance Project through site visits, consultation with local stakeholders and desk-top review of relevant information. This task will be completed by 31 May 2012.

4.3.2 Identify Preferred Transfer Station Locations

The strategy identifies that transfer stations will be located in or adjacent to the communities of Bolnisi, Dmanisi, Tetritskaro and Tsalka. Potential specific locations for transfer stations will be "pre-identified" in or adjacent to each of these communities. The pre-identified sites will be studied in detail as part of later site specific work to confirm their suitability for use for transfer stations. This work will be undertaken by the Waste Governance Project through site visits, consultation with local stakeholders and desk-top review of relevant information. This task will be completed by 31 May 2012.

4.3.3 Identify Preferred Local Processing Centres

The strategy identifies that local processing centres should be established for the processing of construction waste and, in some cases, for composting of green waste; these sites should be located at rehabilitated local waste disposal sites. Potential specific locations for local processing of these wastes will be "pre-identified". The pre-identified sites will be studied in detail as part of later site specific work to confirm their suitability for use for transfer stations. This work will be undertaken by the Waste Governance Project through site visits, consultation with local stakeholders and desk-top review of relevant information. This task will be completed by 31 May 2012.

4.4 Mobilize Financing

4.4.1 Identify Financing Opportunities

Financing opportunities will be identified beginning in January 2012. Appropriate financing opportunities will be those that:

- Target public sector environment and/or waste management infrastructure and equipment investment

- Include a provision (preferably on a grant basis) for:
  - Project preparation in advance of investment; this will allow work to finalize the locations of project investments, the preparation of initial engineering designs, the completion of environmental and social impact studies, and other project preparation work
  - Technical assistance in parallel with and following investment; this will allow technical support to the Inter-Municipal Entity to ensure implementation is carried out effectively.

This activity will include discussions with potential financing entities. Initial financing entities will be identified by 31 March 2012. However, programs change and it may be that additional financing possibilities are also identified in the following months.

4.4.2 Prepare/Finalize Documentation

Documentation necessary to support an application for financing will be completed. The way this is done will be considered in light of the specific financing mechanism(s) that are pursued; however, it is clear that the Waste Governance Project may not have the resources necessary to undertake the work that is required; parallel resources may therefore be required that are mobilized through action 4(i), above. The extent and precise timing of the work that is required will depend on requirements of the financing entities involved, but is expected to be completed by October 2012.

4.4.3 Apply for Financing

An application will be made for financing of the strategy following completion of the documentation necessary to support the application. It is anticipated that the application will be made by the Inter-Municipal Entity, but this will depend on the requirements of the financing entity as well as considerations in Georgia.

4.4.4 Implement Investments

It is anticipated that implementation of the investments necessary to give effect to this strategy can begin, at the earliest, in February 2013. However, this is dependent on the requirements and internal processes of the financing entity, the extent of additional preparatory work that a financing entity may require (e.g. preparation of feasibility study, development of engineering documents/drawings, preparation of financial and institutional arrangements etc.) and negotiations concerning the financing. The Waste Governance Project will support implementation of the strategy but does not have the mandate or the resources to be directly involved; implementation will therefore be undertaken with the resources that will have been agreed with the financing entity. It is possible that financing may be available to complete preparation activities from sources other than the entity that finances project implementation, and these opportunities will also be pursued. It is likely that the period of implementation will extend beyond the period of implementation of the Waste Governance Project.

4.5 Public Awareness

4.5.1 Maintain Public Awareness Activities

It will be essential to maintain public awareness actions through the implementation of this action plan. Maintaining public awareness activities will ensure that residents are aware of the benefits of improved waste management and will build support for the implementation of waste management investments. Initially, public awareness actions will be implemented by the Waste Governance Project. After it has been established, the Inter-Municipal Entity will implement public awareness actions with the support of the Waste Governance Project.