

Solid Waste Management

in Bulgaria, Croatia, Poland and Romania

**A cross-country analysis of sector challenges
towards EU harmonization**



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SOLID WASTE MANAGEMENT IN BULGARIA, CROATIA, POLAND, AND ROMANIA: A CROSS-COUNTRY ANALYSIS

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Conclusions and findings of the report are based on data and documents available by October 2010. An early version of the report was discussed with representatives from the European Commission (EC) in Brussels during March 2010; in January 2011, the final draft was made available online in English and a Bulgarian, Croatian, Polish, and Romanian translation for comments from country representatives. We are very grateful for the comments received from colleagues at the EC General Directorates Regional Policy, Environment, and Enlargement, and from the Ministry of Environment in Poland.

FOREWORD

Reducing the environmental impacts of solid waste generation will continue to be a priority of European Union (EU) environmental policy. Successive directives on solid waste management have strengthened norms and policy guidelines for implementation by EU members; and the EU supports the sector development to the required standards with grant funding to member states and candidate countries. Yet, despite the significant amount of financial resources allocated to the sector, many countries face the challenge of being behind on the ambitious targets.

The European Commission has committed EUR2.45 billion in grant assistance to support implementation of national waste management strategies in Bulgaria, Croatia, Poland, and Romania. However, solid waste management suffers the greatest lag in implementation when comparing progress with “*acquis communautaire*” compliance in these four countries. The first accession treaties’ deadlines have arrived, such as closure of non-compliant waste disposal sites, and targets are being missed. New member states face possible infringement procedures, some of which are already underway. What are the reasons for weak performance in the sector?

This study analyzes progress in Bulgaria, Croatia, Poland, and Romania; and identifies important shortcomings towards meeting the requirements of the EU “*acquis communautaire*”. All four countries have had access to large amounts of assistance from EU programs and European Financial Institutions, which for the most part remain unspent. The study identifies strengths and weaknesses in the national institutional arrangements; scrutinizes sector economics and financing, including how current incentive mechanisms affect the medium- to long-term sector financial sustainability; and finally, extracts lessons learned on how to address key issues and optimize sector performance.

EXECUTIVE SUMMARY

I. The EU as driving force for reform

1. The European Union sets the policy framework for municipal solid waste management that drives reform initiatives in new EU member states and candidate countries. The EU policies, implementation targets, and grant funding establish the enabling environment that transforms the solid waste management sector in Bulgaria, Croatia, Poland, and Romania. The EU 'directives' guide member states towards agreed targets without prescribing in detail how specific measures should be implemented. Various directives establish the legal framework for solid waste management, provide specifics, and an implementation timetable: these include the Waste Framework Directive, the Landfill Directive, and the Waste Incineration Directive.

2. In October 2008, the EU adopted a new and simplified Waste Framework Directive, which at the same time raised the targets for member states. Targets are binding on all member states, but accession negotiations included transition periods for new member states to provide sufficient time for implementation. However, whether transition periods were realistic is now in question as the first deadlines arrive and even older, more affluent member states struggle to meet the targets.

3. EU funding for SWM projects is available from different sources. A total of EUR277 billion in Structural Funds and EUR70 billion from the Cohesion Fund are at the disposal of Member Countries for the 2007-2013 planning period. The member states develop Operational Programmes (OPs) which set out regional or sectoral priorities in line with national objectives. EUR2.45 billion of EU grants was allocated for Waste Management investments in Bulgaria, Poland, and Romania. Croatia, as a candidate country, receives financial support through the Instrument for Pre-accession Assistance (IPA). EUR26 million was allocated to Waste Management in IPA 2007-09 for Croatia.

II. Implementing the EU policy: a country-by-country overview

4. All four countries have drafted national waste management strategies, setting out policy guidelines and comprehensive approaches that generally translate the EU policy on solid waste management into national approaches. However, all four countries face implementation delays, and the rush to absorb EU grant funds has created sector distortions that may affect financial sustainability in the long term.

5. **Romania.** By 2015, Romania must close 150 old municipal landfills and 1,500 illegal dumpsites, and establish 30 national integrated solid waste management (SWM) systems. The EU legislation and standards for waste management were transposed into national legislation, with some transition periods for full compliance: 2017 for municipal landfills; 2009 for temporary storage of hazardous industrial waste; and 2013 for non-hazardous industrial waste. Around 90 percent of urban residents, but only 6.5 percent of the rural population have access to organized solid waste management services. Government cost estimates for meeting EU norms are EUR1.8 billion—or investments of about EUR25-30 million per county, creating a funding gap of at least EUR870 million. ERDF grants will provide only up to EUR930 million to execute the municipal waste axis of OP-Environment. However, it appears doubtful that ERDF grants can be fully absorbed; few projects are ready for financing due to weak municipal institutional capacity to prepare projects. Pre-accession program experience revealed that available funding far exceeds local-level absorption capacity, and raising counterpart contributions is difficult.

6. **Bulgaria.** Bulgaria has progressed toward meeting EU *acquis communautaire* requirements, but substantial investments are still needed to streamline the waste management system to comply fully. Total costs to meet EU norms are estimated at EUR370 million, equivalent to 20 percent of total funding in OP-Environment. Despite generous EU structural funding that covers 85 percent of all investment needed in the waste sector during 2007-2013, national public co-financing of EUR 55 million is still required, plus technical assistance to prepare and monitor investment projects. In November 2009, a new mechanism for waste management infrastructure development under the SOP Environment came into effect. Under the new mechanism, the Government will provide financial resources directly from the national budget to close non-compliant regional landfills and finance preliminary treatment facilities, while SOP resources will focus on construction of regional waste management systems; it also aims at introducing instruments to support the project preparation process. Despite recent progress, main issues remain, in particular to close down wild dumpsites in non-compliance with prevailing legislation, meet the EU targets on recycling and reducing landfill waste disposal, and ensure long-term financial sustainability for the sector.

7. **Poland.** Strategic directions for solid waste management in Poland are outlined in waste management plans (WMPs) at three different levels—national, regional, and local—with substantial room for discretion. A new 2014 National Waste Management Plan (NWMP) was prepared for adoption in late 2010. The Plan continues the policy directions outlined in the NWMP 2010, adopted in December 2006, which was the most recent policy document governing implementation of the national solid waste management strategy and provided the latest available data on the sector¹. Waste separation and recycling is a key issue, and where Poland needs to show the most progress. Unofficial figures estimate that up to 95 percent of waste is still dumped in non-compliant landfills; and the EC doubts that Poland can meet waste framework directive the requirements by the 2012 deadline. Slow progress is primarily due to the unsolved question of who owns municipal solid waste, and limited local-level capacity to prepare and implement projects further creates delays. Despite large outstanding waste management issues, Poland allocated fewer EU cohesion funds and national public funds to the sector than Bulgaria or Romania. In the OP Infrastructure and Environment 2007-2013, EUR1.43 billion was allocated to waste management, of which the EU will fund EUR1.2 billion, only about 4.35 percent of total cohesion funds available to Poland for this period. The substantial EU grants made available to Poland through the Cohesion Fund are still insufficient to cover all capital investment needs to meet EU targets. However, Poland lags other new EU members in creating incentives to mobilize private finance for environmental infrastructure; the sector is too dependent on public extra-budgetary Environmental Funds and EU instruments, insufficient for required investment levels.

8. **Croatia.** As part of EU accession process, Croatia has been actively reforming its waste management sector. An estimated EUR35 million was allocated to develop an integrated waste management system during 2007-09; about 75 percent was EU contributions through IPA funds. Most funds will help establish new county (regional-level) waste management centers; but landfill siting and public opposition to siting new facilities is a main challenge, especially for incineration. Public awareness and communication efforts will need to be substantially expanded in parallel with waste investment plans. Most official landfills lack weigh-bridges and do not perform inventories, so accurate data on waste flows and composition are unavailable for detailed planning and design. On average, 93 percent of people have access to organized municipal waste collection. A substantial share of waste goes to landfills, most of which are non-sanitary; although some sanitary landfills are under construction. Landfill restoration and closure began in 2004, but has to be carefully

¹ The 2014 National Waste Management Plan was adopted on December 24, 2010 and came into force in January 2011, but was not available at the time this report was prepared.

coordinated with the construction of new landfills in compliance with EU standards. A particular challenge for Croatia will be island waste collection; the country has over 1,000 islands with scant populations, but substantial tourist traffic, making waste collection costly and logistically challenging to implement.

III. Sector performance: a cross-country analysis

9. Comparing the progress in implementing the *acquis communautaire* in all of the four countries, solid waste management suffers the greatest lag. What are the reasons for weak performance in the sector? To answer this question, the study analyzed national institutional arrangements to identify strengths and weaknesses; and scrutinized sector economics and financing, including how current incentive mechanisms affect the medium- to long-term sector financial sustainability.

10. **Institutional arrangements suffer gaps and inconsistencies.** Influenced by EU norms and other EU country examples, the legal framework and institutional structure in the solid waste sector is comparatively similar in Bulgaria, Croatia, Poland and Romania. Local-level implementation responsibility for solid waste management is generally decentralized to municipalities. However, municipalities in some countries lack the legal basis for good service provision. Furthermore, national waste management strategies do not always ensure consistency across levels of government. Sometimes, regions or counties roles are blurred, and ministries of environment responsibilities overlap with those of other line ministries. Often, priorities differ and lack of coherence among government levels leaves municipalities without clear policy guidelines in the sector. Legal frameworks not always support strong, functioning inter-municipal entities required to achieve optimum cost efficiency in larger, integrated systems.

11. **Crucial supervision and enforcement capacities remain weak.** National enforcement of standards is critical to achieve compliance with EU norms; municipalities alone cannot enforce high environmental standards in the sector. All four countries have established regulatory regimes that appear to meet EU requirements. Environment ministries set sector standards, establish the licensing system, and issue permits. De-concentrated, sometimes independent regional directorates or environmental inspectorates support MoEs in supervision and enforcement. However, enforcement capacity remains critically low in these four countries and monitoring and data collection are limited. At the same time, countries that successfully improved their solid waste management systems to reach compliance relied on strong enforcement and incentive programs.

12. **Lack of coherent planning and weak consultation procedures.** The quality and coherence of waste management plans vary widely among different levels of government. Many comprehensive national plans appear to ignore realities on the ground; regional planning is still weak in all four countries; and legal mandates require strengthening to ensure local ownership. Weak regional planning processes are most apparent in problems surrounding siting for regional-sized landfills, which has been the single most difficult obstacle in implementing planned investments. Although effective regional planning—including technically sound Environmental Impact Assessments, extensive consultation and public outreach—do not guarantee success, they are crucial to help moderate against Not-In-My-Backyard (NIMBY) delays. Public consultations in particular require more than the lip service that has been observed in these four countries.

13. **Focus on investment has obscured cost recovery needs.** Maintaining solid waste operations according to EU norms is expensive, even with less stringently enforced norms. Total solid waste management costs in western EU typically exceed EUR100 per ton. Despite this, none of the countries

has a plan to tackle the absolute critical issue of cost recovery. Most local tariffs are insufficient, even to cover recurring costs. In all four countries, national strategies have focused on investments required to meet the accession treaties' targets, and in particular on absorbing dedicated EU grant funding. A result has been insufficient attention to medium-term economic sustainability. Focusing grant resources on "hard" investments is an incentive to maximize investment size and inflow of grants into the local economy, but exemplifies a sub-optimal use of resources. One example is the number of inhabitants per landfill; some regional systems serve fewer than 100,000 people— much lower than generally seen as economic minimum. Opting for a larger number of landfills simplifies difficult inter-municipal negotiations for site locations but increases future operating costs unnecessarily.

14. **Leverage financing will require improved private sector conditions.** Typically, systems that generate revenue attract financing. However, the global financial crisis makes it more difficult for local governments to find financing for public service investments with inherent risks that marginalize attractiveness for private sector investors. To achieve financial sustainability, countries will need advice on how to best use PPPs. Governments must reduce investment risks for the solid waste sector, beginning with basic technical risks, such as improving knowledge and data on predictability of waste flows, right up to financial and regulatory risks.

IV. Approaches to optimize the sector: three key dimensions for improvements

15. Based on this analysis, the study extracts lessons learned on how to address key issues and concludes with policy recommendations to help optimize sector performance. Reforms along three key dimensions are required: (i) improve the institutional arrangements; (ii) operationalize national waste management plans; and (iii) progress towards medium-term economic and financial sustainability.

Improve institutional arrangements

16. **Build strong enforcement capacities.** Compliance with the prevailing environmental legislation is usually best enforced through legally independent bodies that may act on their own initiative, and take appropriate enforcement actions through fees and other sanctions, including prosecution. Enforcement aims to avoid potentially high fines linked to EU infringement procedures for non-compliance; but in addition, effective enforcement is essential to establish incentives for authorities and their contracted operators to plan, implement, and maintain an integrated solid waste management system. Enforcement systems also provide a public mechanism to respond to user complaints, and increase acceptance for final disposal and other waste treatment solutions over the longer term.

17. **Increase local ownership.** Ambitious national waste management plans have yet to be translated into regional and local plans. Local authorities, the main drivers for implementation, have not yet assumed sufficient ownership to embark on ambitious plans that include significant infrastructure investments, plus landfill siting and tariff increases that are often unpopular among the local population. Building municipal-level momentum will require additional incentives for good performers, increasing sanctions for non-compliance and worse performers, and improved public communication and outreach campaigns to engage the local population.

18. **Allocate more time and resources for landfill siting procedures.** Good practice suggests the importance of consultative landfill siting grounded in solid technical assessments in an iterative

process that incorporates public participation at each stage. Technical studies should be sequenced and assess landfill siting options in conjunction with robust environmental impact assessments (EIAs), strong public involvement, and alternative analysis of short-listed sites. Ultimately, the site-specific EIA should be linked with the environmental permitting process in a transparent manner with complete public involvement. This can involve higher up-front costs and time, but it ensures that the process keeps moving forward, without surprise reversals.

Operationalize national waste management plans

19. **Increase central-level implementation capacity.** Dramatic improvements required by EU targets need a strong top-down push through adequate program management, planning procedures, and incentive mechanisms, but the central level lacks capacity to operationalize national strategies. Central ministries require enough staff to operate effectively, with realistic plans, monitorable targets, and intermediate deadlines. However, building central-level capacity does not mean a return to old-style central planning. For example, in Bulgaria, during the first phase of implementing the national waste management plan, fund absorption was slow, so during the second phase, Government opted to allocate funds for regional sanitary landfills through decisions at the national level and the Ministry of Environment even participated in landfill site selection. While this may assist municipalities during the preparation phase, lack of local ownership will likely delay implementation and may cause future issues with the local population, whose support will be needed when landfills begin to accept larger waste volumes from other regions.

20. **Strengthen inter-municipal entities for regional waste management.** Integrated solid waste management depends on effective regional-level implementation and coordination. International experience demonstrates that strong inter-municipal entities are crucial for regional planning and service administration. They require a solid institutional, technical, and financial operational base, and often operate through a regional public company that has sufficient autonomy and resources, supervised by the founding municipalities. Assistance is needed to establish strong, negotiated inter-municipal agreements as the ‘institutional backbone’ of regional integrated solid waste management systems. These agreements need to specify responsibilities, distribute risks, and share benefits among signing parties.

21. **Provide support for project preparation.** Lack of financial, technical, and organizational assistance for project preparation impedes using available investment funding and implementing existing policy. Grant and technical assistance programs should emphasize this up-front bottleneck. Local and inter-municipal level administrative units are expected to make integrated solid waste management systems functional. These units apply for funds based on the project proposals they develop and submit for approval to the funding authority administrator, however, they lack capacity and resources to submit project proposals, commission feasibility studies and technical designs, prepare bidding documents, and contract for goods, works, and services. Earlier EU newcomers, such as Ireland, used available grant funding to support project preparation, and mobilized private capital for project implementation.

Progress towards medium-term economic and financial sustainability

22. **Increase the share and improve the conditions of private sector participation.** Participation of private providers in waste management services can benefit the system as a whole. Public budgets are spared necessary investments in SWM systems, private enterprises can bring innovations and good management expertise into play, they decrease the possibility of patronage politics, and they make the provider directly accountable to the clients—especially in situations in which the

government offers no subsidies for service provision. Well written contracts with adequate risk apportionment that are tendered through transparent mechanisms, can also greatly contribute to improving the cost-efficiency of the system as a whole.

23. **Where possible, link service level improvements to tariffs increase.** Governments often opt for low tariffs to ensure access to affordable services for low income groups. However, insufficient tariffs do not cover recurring costs and make waste management less attractive to private operators, or can reduce accountability to clients. If fees remain low for short-term political gain, service provider dependent on government grants to cover the financing gap, or cut back on service quality. At the same time, tariff increases are more difficult to justify later without parallel improvements in service quality. More recycling can bring additional revenues for private operators, but despite a vibrant recycling sector in all four countries, improving recycling requires stronger public education and outreach.

24. **Define clear affordability limits but improve access to services.** In many countries, low income groups bear a disproportionate share of inefficient services, and often must pay higher prices than more affluent households. Households with low income, for example, in rural areas, rarely benefit from economies of scale and network externalities, and often are taken advantage of by individual providers, especially by area monopolies. As a result, low income groups tend to spend a higher share of their budget on lower quality services. Central or regional governments can help poorer jurisdictions by bringing them together to negotiate as a group with individual providers.

IV. Conclusion and the way forward

25. Bulgaria, Croatia, Poland and Romania have had access to large amounts of EU grant assistance and support from European Financial Institutions, which for the most part remain unspent. Despite generous financial assistance to adopt national waste strategies, the current set-up of international assistance seems to fall short tackling essential systemic issues. None of the three new EU members is on the path to using all solid waste management ERDF funds by the target date. Currently available funding sources have not been used or assigned to optimize sector performance, but, with few exceptions, finance projects or project preparation. Yet the last ten years have demonstrated that a project-by-project approach is inadequate for new members to achieve sufficient scale to come within reach of the moving target of EU waste policy.

26. Solid waste management performance improvements would need a more systemic sector approaches compared to those of the past. Sector interventions in individual countries would require tailored solutions that match issues as identified in this report, but also balance specific implementation capacity. EU member countries soon will need to initiate elaboration of Operational Programs for the new structural funds funding period (2014-2020). The results of this process will define if available EU grant resources will be used wisely and in an economic and financially sustainable way. Findings of this report could be most timely to support this process.

I. INTRODUCTION

1. European Union (EU) policies and grant assistance have been the key drivers for transforming municipal solid waste management in new EU member and candidate countries; and the reduction of environmental impacts from waste generation will continue to be a priority of the EU's environmental policy. Successive directives on solid waste management have strengthened norms and policy guidelines for implementation by EU members; but many new EU members now face the challenge of being behind on the ambitious targets towards compliance.

2. The World Bank has a rich portfolio of activities to support development in the solid waste management sector, including in the Europe and Central Asia (ECA) Region. However, in view of the grant funding and alternative financing options available, the World Bank in recent years had little to no engagement in the sector in the new EU member and candidate countries. The objective of this study is to reconsider if this position is justified and whether—in view of the challenges to develop the sector to compliance with the EU *“acquis communautaire”*—there would be a need and role for the World Bank to re-engage in the sector.

3. Against this backdrop, this report analyzes progress in implementing solid waste management strategies in Bulgaria, Croatia, Poland, and Romania and identifies major shortcomings towards meeting the requirements of the European Union (EU) *“acquis communautaire”*. Chapter II describes the EU framework and enabling environment as the driving force for reform in the selected countries. Chapter III reviews how the four countries have translated the broader EU agenda into their national systems, and reviews progress in meeting the targets and absorbing EU funds. Chapter IV analyzes results of this adaptation process and identifies major shortcomings that affect sector performance. Chapter V discusses what the World Bank could do to help address these shortcomings—through direct country engagement and intensified dialogue with the Commission.

4. The data, analysis, and findings of this report are based on literature research and extensive discussions with representatives of national and local sector authorities in the four countries and meetings with representatives of the European Commission (see Annex 1).

II. THE EU POLICY ON WASTE MANAGEMENT: ENABLING ENVIRONMENT AND DRIVING FORCE FOR REFORM

5. European Union (EU) policies are key drivers of solid waste management policies in the Member States and the allocation of substantial grant funding for implementation of such policies is of particular relevance in the new Member States, candidate countries, and potential candidates. The European Commission is charged with the task to set clear environmental targets and standards for Member States and to monitor that they adopt and enforce EU directives. The EU waste management policy calls for long-term systematic approaches, including investing in a regional system for waste collection, recycling, and disposal, and closure of non-compliant waste disposal sites and incinerators. This chapter presents an overview of these policies and of the funding instruments. Special attention is paid to the four countries that are subject of the study, Bulgaria, Poland, Romania, and Croatia.

A. The Policy Framework and Relevant EU Directives

The 6th Environment Action Program 2002-2012

6. The development of the environmental legislation of the European Union, in particular in the waste management field, is a dynamic process continuing for more than 30 years. The 6th Environment Action Programme² (EAP) sets the basic principles and targets of the environmental policy of the Community until the year 2012 and specifies the measures to be taken.

7. The main purpose of the 6th EAP is to ensure that economic growth is in conformity with limitations put on the consumption of natural resources and sustainable with waste generation minimized. The EAP requires an overall decrease in waste quantities generated by improvement of waste prevention activities, better resource utilization and transition to more sustainable consumption and production patterns. In the field of waste prevention, the 6th EAP identifies the increase in the quantity of waste generated as a major challenge. Construction of waste treatment facilities requires larger areas of land and waste management activities also contribute towards air, water and soil pollution. For future waste generation, the EAP aims to attain the following objectives:

- (i) Waste generated displays minimum hazardous properties and constitutes limited risk to human health and the environment;
- (ii) Achieving a significant overall reduction in the volumes of waste generated through waste prevention initiatives;
- (iii) Encouraging re-use of wastes that are still generated;
- (iv) Waste amounts requiring final disposal are reduced to the absolute minimum and the waste is safely disposed;
- (v) Waste is treated in one of the nearest appropriate facilities without impairing the efficiency of the treatment operations.

² 6th Environment Action Programme "Our future, our choice".

8. In compliance with the targets and general strategy for waste prevention and increase of recycling, a considerable reduction is necessary of remaining waste that needs to be sent for final disposal. Also, quantities of generated hazardous waste require minimization.

Relevant EU Directives

9. Various EU directives establish the legal framework for solid waste management and provide the specifics and timetable for implementation³. The most relevant directives in the field of solid waste are the Waste Framework Directive (2008/98/EC), the Landfill Directive (1999/31/EC), and the Waste Incineration Directive (2000/76/EC). Additional directives under the Framework Directive further specify details for specific waste streams. There is, however, no single directive dedicated to municipal waste management only, although general provisions on waste management apply to municipal waste and almost all waste directives have specific provisions on municipal waste (e.g. household waste).

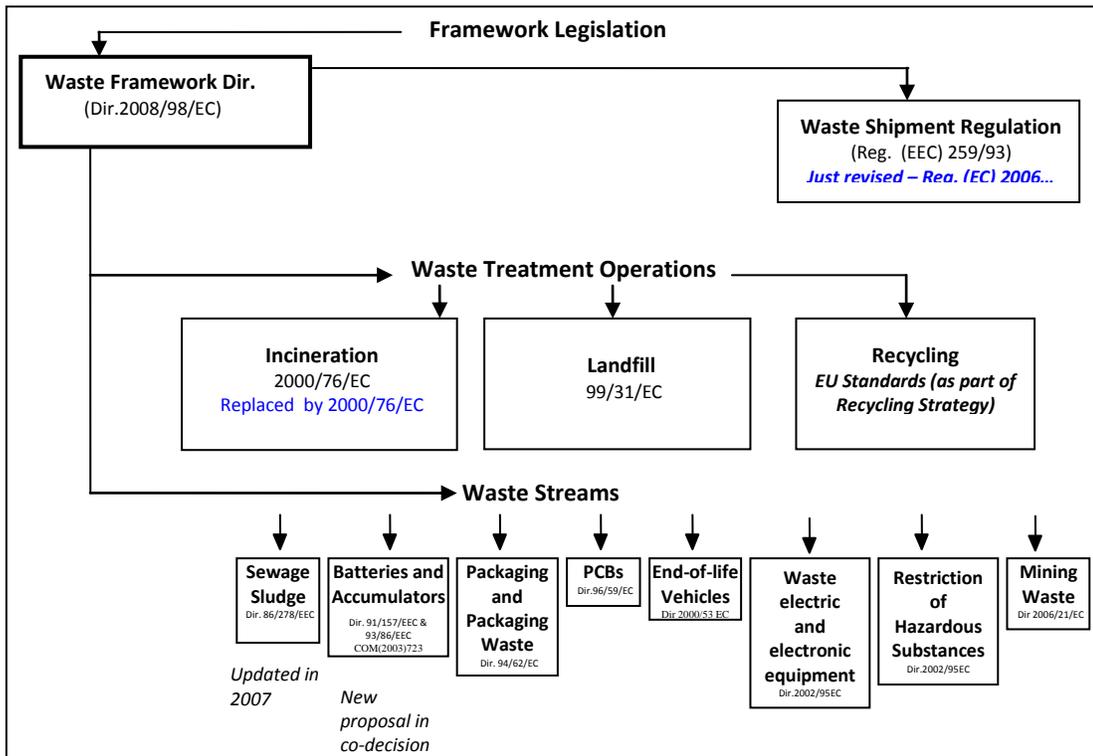
10. **Framework Legislation.** The Waste Framework Directive (WFD) provides guiding principles outlining the rules and requirements to be fulfilled by all member countries in solid waste management. The implementation of such requirements varies by countries; there is a shorter time horizon for the more advanced countries such as Poland, and a longer one for Romania, Bulgaria, and EU candidate Croatia.

11. The Community adopted a simplified version of the WFD in October 2008. A substantive change introduced in the new WFD concerns measures to promote reuse and recycling of waste. The revised WFD streamlines EU waste legislation by repealing the WFD (2006/12/EC), the directive on hazardous waste (91/689/EEC) and part of the directive on waste oils (75/439/EEC). The key Directives laying out requirements for waste management under the Framework Legislation were not revised. They distinguish between (i) waste treatment; and (ii) waste streams and are the Landfill Directive and the Waste Incineration Directive. Recycling standards are addressed as part of the EU Recycling Strategy. The latter is not a directive but a Communication, hence with no legal obligation for the Member States to follow (see Figure 1):

- (i) *The Landfill Directive* establishes strict requirements for landfills to prevent and reduce negative effects on the environment. The Directive specifies measures for leachate collection, landfill gas management and protection of groundwater. Among other requirements, the Landfill Directive states that waste must be treated before being landfilled and that biodegradable waste going to landfills must be reduced gradually to 35% of the levels of the total amount of biodegradable municipal waste produced in 1995 (see Table 1).
- (ii) *The Waste Incineration Directive* aims to prevent or to reduce negative effects on the environment caused by incineration or co-incineration of waste as far as possible. In particular, the Directive seeks to reduce pollution caused by emissions into the air, soil, surface water and groundwater, and thus lessen the risks which these pose to human health. This is to be achieved through the application of operational conditions, technical requirements, and emission limit values for waste incineration and co-incineration plants within the Community.

³ EU Directives are legislative acts that need to be transposed into the national legislation by the Member States.

Figure 1: Overview of EU Waste Legislation



- (iii) *In the Recycling Strategy*, re-use and recycling are considered important tools to reduce environmental impacts and the consumption of valuable resources. The EU Strategy on Prevention and Recycling of Waste, COM (2005) 666, defines the objectives as ‘limiting waste, and promoting the re-use, recycling and recovery of waste’. Recent recycling targets for municipal and construction and demolition waste have been incorporated in the 2008 revision of the EU Waste Framework Directive, which requires that by 2020, at least 50 percent of materials of such as glass, metal, plastic and glass from households and possibly other sources should be recovered for re-use and recycling (see Table 1). For construction and demolition waste, the target is a 70 percent reduction for the same year. Other than these overall targets, the WFD does not include targets for individual materials in household waste. The WFD refers to separate directives to regulate waste minimization among certain waste categories such as packaging waste and end-of-life vehicles.

Solid Waste Management Targets

12. In the WFD, waste is defined as “any substance or object which the holder discards or is required to discard, and waste management as the collection, transport, recovery, and disposal of waste, including the supervision of such operations and after-care of disposal sites”. A strong emphasis is placed on waste prevention and the following waste hierarchy is encouraged:

- a) prevention
- b) preparing for re-use
- c) recycling

- d) other recovery (e.g. energy recovery through incineration)
- e) disposal

13. The costs of waste management must be borne by the waste producer (or the current or previous waste holder), in accordance with the *polluter-pays-principle*, and Member States should have the appropriate institutional framework in place to ensure that waste is treated by the waste producer (or holder), or by a hired broker or dealer.

14. According to the principles of self-sufficiency and proximity, a network of disposal facilities should be established throughout the country, serving all communities and their respective waste management needs. Furthermore, every country is required to have a waste management plan, and they are expected to establish waste prevention programs no later than four years after the Directive enters into effect. Waste prevention programs can be part of the waste management plan, or they can function separately.

Table 1: Major targets for waste reduction and recycling according to the EU waste legislation

		minimum recovery	minimum recycling	collection rate
Packaging	2008	60%	55%-80% (material specific rates)	
Cars	2006	85%	80%	
	2015	95%	85%	100%
Electronics	2006	70%	50%	min 4 kg per inhabitant per year
Batteries	2010	50% to 75% (efficiency)		
	2016	45%		
Tires	2006	0 landfilling of tires		
Biodegradable municipal waste	2010	reduction of landfilling to 75% of the 1995 level		
	2013	reduction of landfilling to 50% of the 1995 level		
	2020	reduction of landfilling to 35% of the 1995 level		
Household waste	2020	50% recycling		
Landfills	2009	Conformity with legal requirements for existing landfills		

Source: Based on presentation "Municipal Waste Management in the EU. DG Environment, European Commission" at World Bank Brussels workshop, May 2009; own revisions.

15. Within Member States, designated competent authorities are charged with periodically inspecting establishments or undertakings that are involved in waste management, and the latter are required to keep records on the quantity, nature, origin, and treatment of waste.

16. The solid waste management targets set out in the EU Waste Framework Legislation covers landfills, end-of-life vehicles, waste from electrical and electronic equipment, batteries and packaging.

17. **Recycling Targets.** By 2020, Member States must reuse or recycle 50 percent of the total by weight of specified categories of household waste, (and possibly from other origins having similar waste streams) and reuse, recycle, or recover 70 percent (by weight) of non-hazardous construction and demolition waste.

18. Although waste minimization targets are not included in the WFD, Member States must establish waste prevention programs no later than 2013, five years after the revised WFD came into force.

B. The European Commission role in financing SWM policies

19. Funding for SWM projects is available from different sources, but most important are two General Directorates (DG – Direction Générale) at the European Commission (EC): DG Regional Policy and DG Enlargement. A total of EUR277 billion in Structural Funds and EUR70 billion from the Cohesion Fund are at the disposal of Member Countries for the 2007-2013 planning period. EUR2.45 billion of EU grants was allocated for Waste Management investments in Bulgaria, Poland, and Romania (see Table 2). Structural Funds aim to close the development gaps between regions, in support of those with GDP/capita lower than 75 percent of EU average, and European averages. The Cohesion Fund is for environmental and transport projects in countries with GDP/capita below 90 percent of the EU average (New Member States, Greece, and Portugal). Environmental Cohesion Funds are used primarily for drinking water supply, wastewater treatment, and **solid waste disposal**.

20. Structural funds have two main components: *European Regional Development Fund (ERDF)*, and *European Social Fund (ESF)*. The ERDF is the main fund for SWM projects as it supports programs to enhance regional development, economic change, and competitiveness through regional level Operational Programs (OPs) that reflect regional investment priorities.

21. Regional OPs have some flexibility, but their priorities must align with National Strategic Reference Framework priorities, and be approved by the Commission before implementation. Within countries, Regional OP priorities tend to be unitary across regions, but OP design and expected outcomes vary substantially among countries. For example, in Bulgaria and Romania, *Priority Axis 2 of the Environmental OP* offers funding for SWM projects; in Poland, SWM funding is assured through *Priority Axis 2 of the Infrastructure and Environment OP*.

22. For Croatia, the Instrument for Pre-accession Assistance (IPA) can be used as a flexible tool for funding and getting technical support on SWM projects. In IPA 2007-09 for Croatia, EUR26 million was allocated to Waste Management.

23. In addition to direct fund disbursement, the EU has a series of programs to offer indirect support to SWM projects, such as the Joint Assistance in Supporting Projects in European Regions (JASPERS). JASPERS funds, available for project preparation, help new Member States speed the approval process for projects prepared during the 2007-2013 planning period. The aim is to increase the quantity and quality of projects to be submitted for grant financing under the Structural and Cohesion Funds. JASPERS is managed by the European Investment Bank (EIB) and co-sponsored by the European Commission, the European Bank for Reconstruction and Development (EBRD), and Kreditanstalt für Wiederaufbau (KfW); it targets large EU-funded projects; the minimum funding requirement for environmental projects is EUR50 million.

24. EIB is also an important source of funding for SWM projects. The EIB is the Investment Bank of the European Union, but it also operates outside of the EU, with a particular focus in the candidate and potential candidate countries and the EU neighboring regions. EBRD also plays an active role in financing SWM projects. For an overview, see Table 3.

Table 2: SWM Funding Allocation for Selected Countries

Country	Total EU grants	Environment Funding (TOTAL)	Environment Funding (EU grants)	Waste Management Funding (TOTAL)	Waste Management Funding (EU grants)	Type of EU funding
Romania	€19.6 billion (2007-2013)	€5.6 billion (2007-2013)	€4.5 billion (2007-2013); (14.29% of total EU grants)	€1.17 billion (2007-2013)	€0.93 billion (2007-2013) 2.95% of total EU grants; 20.67% of EU funding for Environment; 80% of total SWM Funding	ERDF 2007-2013 - Operational Programme Environment - Priority Axis 2: Development of Integrated Waste Management Systems and Rehabilitation of Historically Contaminated Sites
Bulgaria	€6.7 billion (2007-2013)	€1.8 billion (2007-2013)	€1.46 billion (2007-2013); (11.41% of total EU grants)	€0.36 billion (2007-2013)	€0.31 billion (2007-2013) 2.42% of total EU grants; 21.23% of EU funding for Environment; 85% of total SWM Funding	ERDF 2007-2013 - Operational Programme Environment - Priority Axis 2: Improvement and Development of Waste Treatment
Poland	€67.2 billion (2007-2013)	€37.6 billion (2007-2013) (Infrastructure and Environment); €6.13 billion (just Environment)	€27.9 billion (2007-2013) (Infrastructure and Environment) (41.52% of total EU grants); €4.84 billion (just Environment) (7.2% of total EU grants)	€1.19 billion (2007-2013)	€1.02 billion (2007-2013) 1.80% of total EU grants; 4.34% of EU funding for Infrastructure and Environment; 25.0% of EU funding for Environment; 85% of total SWM Funding	Cohesion Fund 2007-2013 - Operational Programme Infrastructure and Environment - Priority Axis 2: Waste Management and the Protection of Earth
Croatia	€0.9 billion (2007-2012); €0.4 billion (2007-2009)	€0.071 billion (2007-2009)	€0.053 billion (2007-2009); (13.25% of total EU grants)	€0.035 billion (2007-2009)	€0.026 billion (2007-2009) 6.5% of total EU grants; 49.06% of EU funding for Environment; 75% of total SWM Funding	IPA 2007-2009 - Environment Operational Programme - Priority Axis 1: Developing waste management infrastructure for establishing an integrated waste management system in Croatia

Sources: SOP-ENV 2007-2013 Romania (2007); SOP-ENV 2007-2013 Bulgaria (2007); SOP-Infrastructure and Environment 2007-2013 Poland (2007); SOP-ENV 2007-2009 Croatia (2007)

Table 3: SWM Project Financed by European Financial Institutions

Project Name	Country	Description	Year of Signing	Signed Amount (Euro)
EIB				
Sofia Municipal Waste Project	Bulgaria	Establishment of an integrated system for the treatment of the municipal solid waste generated in Sofia Municipality	2010	50,000,000
National Environmental Protection Fund (Water, Sewerage, Solid Waste)	Poland	Investments in water and sanitation infrastructure	2009	120,653,459
NSRF Co-financing Facility (Water, Sewerage, Solid Waste)	Romania	Co-financing of sector operational programmes in areas of environment, economic competitiveness and transport	2008	250,000,000
Municipal Environment Infrastructure	Romania	Municipal investments in water, sanitation, and solid waste management	2008	31,101,415
Municipal Environment Infrastructure	Romania	Municipal investments in water, sanitation, and solid waste management	2007	12,223,500
EBRD				
Zagreb solid waste management	Croatia	Completion of two landfills	2003	17,100,000
Zagreb solid waste management	Croatia	Completion of two landfills	1998	23,974,000
Wroclaw multi-sectoral municipal Infrastructure	Poland	Modernization of drinking water State treatment plant and sewerage network and upgrade of solid waste landfill	2000	5,460,000
Arges County Regional Solid Waste	Romania	Create a new landfill site and improve waste collection facilities	2006	6,125,000
Bacau Solid Waste Management	Romania	Create a new landfill site and improve waste collection facilities	2006	5,000,000
Municipal Environmental Loan Facility	Romania	Provide co-financing to EU-ISPA funded investments in the water, waste-water and solid waste management sectors	2000	130,000,000

Source: EIB and EBRD

C. Implementation in Member States: Sectoral Operational Plans

Implementation of EU directives in individual Member States

25. The EU directives aim to set a course of action for Member States without prescribing the means and Member States decides on how to transpose these into national legislation. If Member States fail to transpose EU directives into national legislation, the Commission must initiate legal action in the European Court of Justice. If an EU directive is *not* adopted into national legislation, or if such adoption is incompletely or late, citizens can still invoke the directive in cases before their national court of law.

26. Directives are binding upon Member States, and most directives have been addressed to all Member States, except for those related to the Common Agricultural Policy. After the EU adopts directives, targeted Member States have a timetable for transforming these directives into national legislation. Sometimes Member States' national legislation already complies with the directives, but more often, Member States must changes their laws, and align directives and national legislation through a process called **transposition**. If Member States *fail to transpose EU directives into national legislation*, or enact new laws that fail to fully comply, or fail to adhere to enacted laws, the European Commission can initiate legal action in the European Court of Justice.

Sectoral Operational Programs (SOPs) as transition and implementation plans

27. **Community Strategic Guidelines (CSG)** set overall EU priorities and the framework for using EU funds, under which each Member State has a National Strategic Reference Framework (NSRF) with priorities linked to national policies. Within Member States, regional Operational Programs align regional needs with the NSRF.

Level	Planning Instrument
EU	Community Strategic Guidelines
National	Member State National Strategic Reference Framework
Regional	Operational Program

28. Community Strategic Guidelines set out cohesion policy principles and priorities, and suggest how European regions can use the EUR308 billion available for national and regional aid programs during 2007–2013. Member States' priorities for using EU Structural Funds during 2007–2013 are set out in their National Strategic Reference Framework (NSRF), required under new Structural Funds Regulations, to establish high-level strategy for regional or sectoral Operational Programs. The NSRF reviews regional economic strengths and weaknesses, and specifies spending priorities for future Structural Funds.

29. **Operational Programs.** An Operational Program (OP) sets out regional or sectoral priorities for delivering EU Structural Funds, and must be consistent with Member States' NSRF. Each EU region has an OP that must be adopted by the Commission before implementation. OPs are also elaborated

for priority sectors in each Member State. For example, Bulgaria has seven sectoral OPs (SOP): Transport, Environment, Competitiveness, Regional, Human Resources Development, Administrative Capacity, and Technical Assistance, developed under the NSRF for 2007-2013. Each SOP lists priorities or Priority Axes for investment.

30. Generally, Sectoral OP for Environment, also referred to as OP-Environment is a Member State's main program document to implement national environmental policy, and typically, 'solid waste management and waste treatment' is a Priority Axis, except in Poland, where waste management is a Priority Axis under the "infrastructure and environment operational program." Within a Sectoral OP, Priority Areas may be funded by a single fund, such as the Cohesion Fund, or combined funds, such as ERDF, Cohesion Fund, National Funds, and funds from IFIs may finance priority investments. Implementation progress is measured by results and output indicators.

31. The Operational Program strategy, objectives, priorities, financing, and implementation framework are based on comparing a SOPs environment sector analysis, including a SWOT analysis with disparities between national averages and EU averages for basic environmental indicators.

III. NATIONAL STRATEGIES AND IMPLEMENTATION ISSUES

32. **Bulgaria, Croatia, Poland, and Romania have drafted national waste management strategies.** Most strategies include central government policy guidelines developed by the Ministry of Environment (MoE). All strategies include comprehensive approaches that translate EU policies on solid waste management into national approaches and adopted key EU guidelines—polluter-pays, priority waste reduction and recycling, and regional approaches to integrated solid waste management.

33. **The EU budget has committed EUR2.5 billion (2009-2013) in grants to implement national waste management strategies.** Despite availability of such large amounts of grant funds (see Table 2), solid waste management implementation lags most other priority areas of the Environment Sector OPs in three of the four countries. The first deadlines on SWM that had been included in the accession treaties are imminent, targets are being missed, and infringement procedures are being threatened, or in some cases, have begun.⁴ This chapter examines each of the four countries; while the following chapter analyzes issues that contribute to delays on a cross-country basis.

A. Romania

Background

34. Romania joined the EU on January 1, 2007. The accession requirements for environmental regulations for waste management included that by 2015, in steps, 150 municipal landfills and 1,500 illegal dump sites must be closed, and 30 national integrated solid waste management systems must be established. The EU legislation and standards for waste management have been transposed into national legislation, with some transition periods for full compliance: 2017 for municipal landfills⁵; 2009 for illegal dump sites⁶ and temporary storage of hazardous industrial waste; and 2013 for non-hazardous industrial waste. In 2005, Romania generated about 8.0 million tons of municipal waste (around 450 kg/person); most was dumped in 234 non-conforming municipal landfills and 2,700 illegal dump sites; none of it was incinerated and less than 2.0 percent was recycled. Around 90 percent of urban residents had access to organized solid waste management services, but only 6.5 percent of rural residents.

Institutional arrangements

35. Romania relies on agencies at three levels to manage waste: the Ministry of Environment (MoE) and Ministry of Administration and Interior (MAI); the County Councils; and municipalities, which must ensure that all non-complying landfills and illegal dumps are closed, existing municipal landfills rehabilitated or extended, and new landfills constructed where needed. Eight Regional Environmental Protection Agencies (regional EPAs) prepare Regional Plans for Waste Management; County Councils prepare county-level Waste Management plans. Regional associations that comprise of municipalities and the County Council are responsible for managing final disposal facilities and transfer stations. This function is delegated to the County Council, including contracting for investments and operation. In small towns and rural areas, where solid waste management

⁴ Such as closing non-compliant landfills.

⁵ Individual municipal landfills have tailored deadlines

⁶ Illegal dump sites can be closed later, but need to be taken out of operation

infrastructure is difficult to sustain, the County Council may also carry out procurement and other administrative functions. Larger landfills near bigger urban areas accommodate waste produced in the entire county; and transfer stations near large urban centers collect waste generated in surrounding regions.

36. Solid waste management services may be carried out by municipalities, private operators, or public private partnerships. Local authorities are legally mandated to organize waste collection and transportation, which can be carried out by a single sanitary company in small towns, or several companies in larger cities. In most rural areas, however, service delivery is mostly inadequate unless near an urban center. The MAI, through the county councils, ensures that most inhabitants or municipal waste producers are connected to regional solid waste management infrastructure. The MoE established a system for monitoring municipal waste management operations according to EU reporting requirements, and is obliged to perform annual inspections of sanitary services. Data are collected by landfill operators; processed and stored by the National Statistics Institute (NSI), and analyzed by the Romanian Association of Solid Waste Management (ARS). Some data are made public in MoE or ARS reports, or NSI publications.

37. The MoE collaborates with MAI, local administrations, professional associations, and NGOs to elaborate communication and education plans at all levels, using mass media, Web publishing, audits, and public information campaigns and awareness activities.

National Strategy

38. Solid waste management is considered to be Romania's most pressing environment issue. The MoE devised a National Waste Management Plan with specific responsibilities and targets. Each county will have an integrated SWM system and county councils will devise plans for municipal waste management. According to such strategy, some 57 EU-conforming landfills, serving an average of 400,000 people, are necessary for Romania's 42 counties, including Bucharest municipality. However, in May 2009, only 18 landfills of the planned 57 conformed to EU-norms; 7 were under construction; 18 had identified a site; and 12 remained in project preparation stage, lacking a site. Since Romania is behind on the landfill construction schedule, in July 2009, the country was close to face charges from EU policy infringement for continued use of illegal waste dumps, with a penalty of EUR 200,000 for each day missing that target. Most penalty costs must be borne by cash-strapped local authorities, although a 1.5 year grace period is possible.⁷

Investment Cost and EU Funding

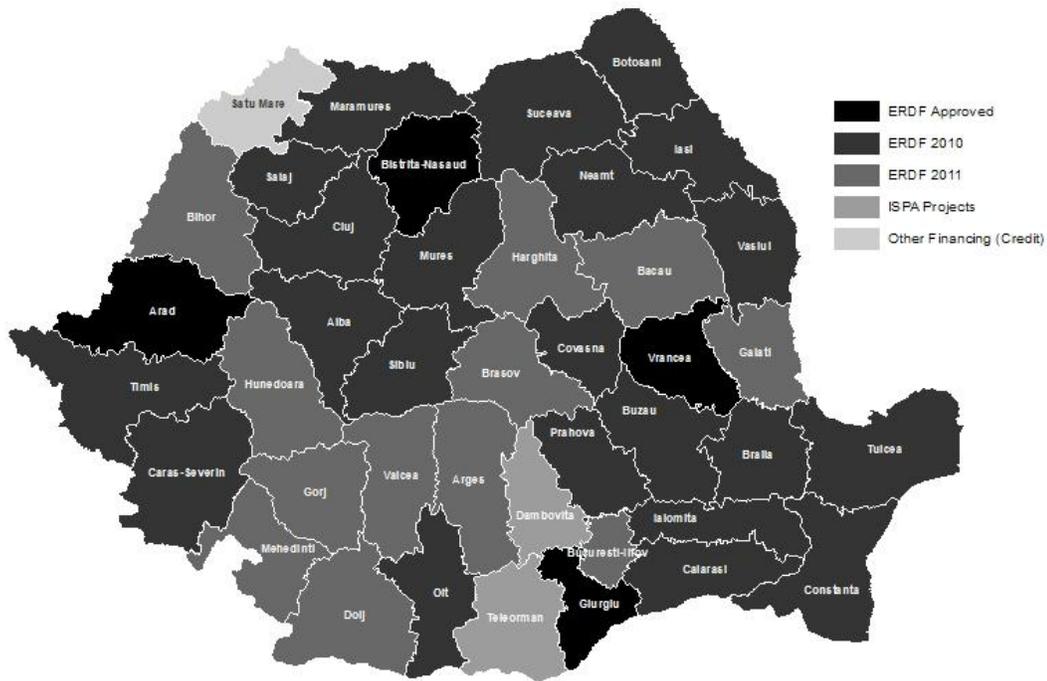
39. Total estimated cost of meeting EU norms is EUR1.8 billion, according to Government. This is about EUR25-30 million required per county to bring all landfills into compliance and upgrade waste management operations. However, estimates are incomplete, as additional large investments will be required to rehabilitate historically polluted sites.

40. There is a EUR0.87 billion funding gap to cover the total investment needs. ERDF grants will provide only up to EUR0.93 billion towards execution of the municipal waste axis of the SOP-ENV. In addition, disbursement is conditional on a local or national Government contribution of 20 percent of project costs, equivalent to EUR0.23 billion. A maximum of 18 percent can be provided through Government grants; the remaining 2.0 percent must be covered by beneficiary counties.

⁷ Member States such as Poland or Ireland have avoided penalties by addressing directive requirements while the infringement process was still underway. So far, only Greece has been fined for non-compliance.

41. It is uncertain that ERDF grants can be fully absorbed since there are too few finance-ready projects due to weak municipal institutional capacity to prepare them. Experience with pre-accession programs has shown that absorption capacity levels are below available funding. Raising counterpart contributions is often difficult. The map below highlights funding types available for waste management projects by counties.

Map 1. Romania: Type of Major Funding Pursued for Waste Management Projects



Main challenges

42. Romania has made significant progress in solid waste management, but challenges remain; primarily weak capacity to implement and manage projects. As the economy develops and consumption expands, waste volumes grow steadily but landfill expansion has not kept pace. Many areas lack adequate SWM infrastructure, particularly remote rural areas, and even where infrastructure exists, success has been elusive. For example, household recycling adoption rates have been low even in the largest urban centers so reaching a waste recycling target of 55 percent by 2013 appears improbable since less than 5.0 percent of waste was recycled in 2010. Improving on this will require comprehensive public awareness and communication efforts in addition to improvements in infrastructure. Overall, both the markets for extraction and sales of recyclables and compost need further development. For example, the waste plans at county level include initiatives for composting, mainly composting plants in urban areas and heap composting in rural areas, but markets to absorb this material have hardly established yet.

43. In general, strong political will exists to promote sound SWM practices; waste management is among Romania’s crucial environmental challenges. However, the institutional framework has yet

to mature sufficiently to fully implement the National Waste Management Strategy, in particular, finding solutions for economies-of-scale among small scattered rural settlements. Some municipalities formed compacts and managed to engage private companies at reasonable rates. However, most still dump waste in non-compliant landfills. Amendments to existing service contracts to include the required system improvements are only allowed for contracts after 2007, which will be challenging for many municipalities.

44. This raises the enforcement conundrum: people who lack recycling bins cannot recycle. While enforcement of sound SWM practices has not been very strong in Romania, enforcement cannot become more stringent without appropriate infrastructure in place. However, infrastructure implementation is slow due to economic, social, and political bottlenecks. For example, landfill site selection is delayed by prolonged community and political resistance. At some sites, selection procedures have taken four years or more. Politically appointed County Councils draft regional SWM plans, so municipalities aligned with other political parties resist Council decisions. Government changes often translate into policy changes, and projects begun by the previous administration are dropped. These cycles impede long-term SWM planning.

B. Bulgaria

Background

45. Bulgaria has progressed toward meeting EU *acquis communautaire* requirements, but substantial investments are still needed to streamline the waste management system to comply fully. Significant pre-accession investments from the state budget and EU programs like the Instrument for Structural Policies for Pre-Accession (ISPA) accelerated Bulgaria's progress over that of its accession partner, Romania. However, despite generous EU structural funding that covers 85 percent of all investment needed in the waste sector during 2007-2013, national public co-financing of EUR 55 million is still required, plus technical assistance to prepare and monitor investment projects. In November 2009, a new mechanism for waste management infrastructure development under the SOP Environment (SOP-ENV) came into effect. The new mechanism takes into account the Government's decision from August 2009 to provide financial resources directly from the national budget to close non-compliant regional landfills and finance preliminary treatment facilities. Under the new mechanism, SOP-ENV resources will focus on construction of regional waste management systems; it also aims at introducing instruments to support the project preparation process to prevent losing financial resources under the SOP-ENV.

46. In 2004, 14.7 million tons of waste was generated in Bulgaria; 3.7 million tons were municipal waste, down from 4.0 million tons in 2001. Most waste came from industry, which grew from 8.2 million tons in 2001, to 10.5 million tons in 2004—due to increased economic activity. However, volumes of collected hazardous and municipal waste declined during 2001-04, despite expanding waste collection services to a larger share of the population.

Institutional arrangements

47. Bulgaria relies on sixteen Regional Environmental Inspectorates and Regional Municipal Associations to manage waste. Inspectorates ensure that the 55 waste management regions under their supervision comply with environmental standards. However, limited enforcement capacity of the Inspectorates will make closing all of about 200 non-compliant dumps challenging. Regional Associations are formally responsible for daily administration of solid waste management services provision, including procurement tasks and issuing contracts, although in practice, their role is

uncertain. Under the new mechanism introduced in 2009, funds for regional investments in the regional systems are now being allocated by central level decision making.

48. Capital investments are financed by combined EU and national funds. Co-financing is by direct allocation from the national budget; or funds from the Environmental Protection Enterprise, an entity associated with the Ministry of Environment to collect fees and co-finance environmental projects. The Bulgarian private sector started providing considerable solid waste management services, particularly waste collection and transport in bigger cities, and recycling, that appears to become an active market. While the private sector manages some landfills, most are operated by public companies from the municipality hosting the landfill. Municipalities monitor service delivery within their jurisdiction; and operators are expected to report regularly. No organized system exists to register consumer complaints or receive feedback; two-way consumer communication is sporadic and varies by municipality.

National Strategy

49. **Progress toward meeting EU targets.** The legal framework is in place, and implementation is underway based on municipal waste management systems with regional disposal and treatment facilities. Inter-municipal associations for regional waste management were created, and by July 2009, 27 regional sanitary landfills complying with EU directives were operational; by end-2009, six more regions anticipated having fully compliant disposal facilities.

50. **The National Waste Management Program (NWMP) was updated recently.** The 2009-2013 Program incorporates the latest EU Waste Framework Directive (2008/98/EC), including indicative recycling targets, and aims for disposal system environmental compliance and reduced landfill waste. The NWMP aims for full absorption of EU funds allocated to the solid waste sector in the Operational Program Environment (OPE) 2007-2013. Under the updated program, construction is planned for 23 additional regional landfills; and the Program envisions completing the waste management system by 2013 with 55 regional sanitary landfills.

51. **Bulgaria's private sector has started to engage in recycling.** Six collection and recycling operators dominate the national market for recyclables. An increasing number of municipalities introduce separate collection facilities run by private operators; and many contractors carry out public awareness campaigns in the communities. Recovery facilities are limited. However, no national data on recycling are available, and serious concerns prevail that the private sector will primarily target higher value recyclables which would not suffice to achieve the ambitious recycling targets.

Investment Cost and EU Funding

52. Meeting EU norms during 2007-2013 is estimated to cost EUR370 million (20 percent of total SOP-ENV funding); the EU will cover 85 percent of those costs (mainly through structural funds); the remaining 15 percent will come from national public co-financing. During accession, negotiations between Bulgaria and the EU revealed that Bulgaria has insufficient resources to fully implement EU directives within defined time limits. Consequently, separate transition periods were established for 10 'heavy directives' from the European Environmental Law. However, no transitional periods were granted to municipal landfills. Priority axis 2 was allotted relatively more EU funding (21.3 percent of total EU funding for SOP-ENV), while the national and local budget burden was lower than for other priority axes (16.5 percent of total national public co-financing for SOP-ENV). The new mechanism now allocates resources directly from the national budget with the goal to accelerate project preparation and implementation under SOP-ENV. All closure activities and financing for pre-

treatment are considered for partial financing through EU funds. After necessary resources for construction of the 23 additional regional systems are determined and/or contracted, funds remaining from the priority axis will be allocated entirely or partially through competitive calls for municipal landfill closure proposals.

Table 4: Implementation program total investment costs for public sector in Bulgaria (in million EUR)

Sector	Total investment costs	Investment costs up to 2005	Investment costs during 2005-2009 (annual and cumulative)					Investment costs after 2009	
			2005	2006	2007	2008	2009		2005 - 2009
Total SOP-ENV	3,367	350	343	405	396	245	274	1,663	1,353
Waste	445	53	51	52	54	29	31	216	176
% of total	13.2	15.1	14.9	12.8	13.6	11.8	11.3	13.0	13.0

Source: SOP-ENV Bulgaria

53. Total investment costs supported in previous years and expected in coming years are highlighted in the table above. The public sector had a lighter burden immediately after accession, but after 2009 the pace of investment has been scheduled to accelerate.

54. Before EU membership, Bulgaria received significant support for waste-related projects through pre-accession instruments (PHARE, ISPA, and SAPARD), and took advantage of IFIs loans and technical assistance. The map below highlights landfills and service areas that have received funding or were expected to.

Main Challenges

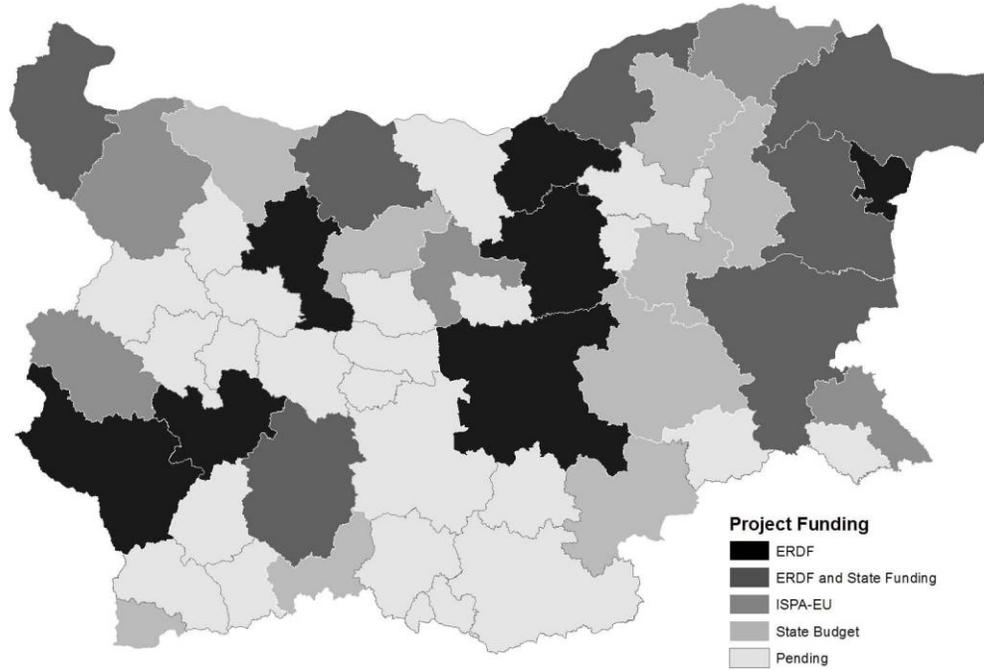
55. **The solid waste sector faces major challenges in the short, medium, and long-term.** Despite recent progress, many issues remain: (i) close down wild dumpsites in non-compliance with prevailing legislation; (ii) meet the EU targets on recycling and reducing landfill waste disposal; and (iii) ensure long-term financial sustainability for the sector.

56. **Closing wild dumps will require existing landfills to increase capacity.** Under prevailing legislation, municipalities were expected to close all wild dumpsites by July 2009. To avoid sanctions, regions without a functioning sanitary landfill will need to dispose of waste at existing sites that comply with EU environmental standards. However, this arrangement escalates transport costs, and assumes that municipalities will accept waste from other regions but unless local communities agree, these arrangements are not deemed possible.

57. **Lack of local ownership limits implementation in the regions.** Although regional waste management associations were set up, it remains unclear to what degree they are operational, whether they are active in regional waste management planning, and to what degree the public was involved selecting landfill sites. Since municipalities drive implementation of regional waste management systems, weak regional associations and low capacity hamper meeting EU targets, absorbing available cohesion funds, or achieving citizen cooperation to accept waste from other localities, which is crucial to a waste management system based on inter-municipal arrangements. Siting regional landfills requires intensive public consultation to overcome the notorious Not-In-My-

Backyard (NIMBY) issue. Even though formal requirements for public consultations are in place, implementation by local authorities is weak.

Map 2. Bulgaria: Funding for landfill projects



Source: National Waste Management Programme (2004), ISPA Strategy for Environment (2003), National Waste Strategy (Fresenius Institute 2005)

58. **Incentives for waste reduction and at-source separation remain low.** Despite a growing recycling market, households have little or no incentives to separate waste. Introducing recycling bins at collection points have yielded some results, but the total share of separated waste collected is still small, and more public education and outreach campaigns will be required. Legally, municipalities were given room to increase fees but they are reluctant to do so because of low willingness to pay in the public. As a result, fees for waste collection remain low and no financial incentives exist to separate or reduce household waste, so meeting ambitious EU targets for recycling and waste reduction seems unlikely.

59. **Many planned and existing landfills are too small to become financially viable.** Judging by waste volumes, many of Bulgaria's waste management regions are too small. Substantial capital investment costs are required to build landfills that comply with high environmental standards and operational costs are high. Consequently, environmentally sound regional landfills require a minimum size to generate economies of scale to become financially viable; typically capacities should not be less than roughly 50,000 tons per year⁸. However, in Bulgaria, EU grant funds might have favored a system of smaller but closely located landfills, i.e., higher investment cost per ton at lower transport costs. Although in the short run it seems rational to use available funding sources for investments

⁸ The optimum capacity of regional disposal sites depends on many parameters such as population density, quality of infrastructure and local geography. Landfills serving less than 100,000 people (or roughly 40,000 tons of waste per year) are normally only favorable when one or more of these parameters dictate such a choice.

only, this curbs long-term financial sustainability for the sector: The current system elevates costs for capital investment and compliant operation. To afford the current structure, fees would need substantial increases; particularly since average prices for waste collection and gate fees are very low compared to other countries in the region.⁹

C. Poland

Background

60. Much of the data on solid waste in Poland used in this report was provided in the 2010 National Waste Management Plan (NWMP), which dates back to 2006. The new 2014 National Waste Management Plan was under preparation in 2010, adopted by the Council of Ministers on December 24, 2010, and entered into force in January 2011¹⁰. As of December 31, 2005, 762 legal landfills were operational in Poland.¹¹ In 2004, total waste volumes estimates were 11.8 million tons. Private operators and municipalities collected 9.8 million tons (down from 12.2 million tons in 2000); only 0.24 million tons of which was separated. Poland is still well under EU targets for waste separation and recycling, a key issue under priority axis 2 of the OP for Infrastructure and Environment. In 2004, 2.5 percent of waste was separated, up from 0.1 percent in 2000; by end-2005, 59 sorting plants and 58 composting plants were operating in Poland.

61. However, accurate data on waste management are difficult to obtain in Poland, and the NWMP has acknowledged data difficulties in monitoring waste management. Figures for waste quantities are arrived at by weighing delivery vehicles at landfill, sorting, or composting facilities. Several private companies collect residential and commercial waste, often *in parallel* within the same districts, and dispose of it at several facilities. While contractors are obligated to report waste composition and quantity, compliance is not enforced so municipalities rarely have credible data. In addition many Polish landfills lack weighing bridges, enabling contractors to underestimate loads to accommodate informal trading among companies and to reduce landfill taxes, now PLN100 per ton of waste. The Local Databank of the Central Statistical Office of Poland collects basic waste data at the municipal level (NUTS 4), but it is unclear how accurate the data is.

Institutional arrangements

62. Regional waste management plans have to be aligned with higher level plans and the National Environmental Policy adopted by the Polish Parliament. To ensure coherence, draft plans are consulted with higher level authorities. For example, the Ministry of Environment organize regular meetings with representatives of central and regional environmental authorities to discuss waste management issues, consult on draft Voivodship waste management plans, and ensure coherent interpretation of legal provisions and implementation of environmental policy. In 2010, this cooperation was institutionalized in a National Network of Environmental Authorities and European Funds Managing Institutions, named "Environment for Development", the Polish equivalent of the European Network of Environmental and Managing Authorities (ENEA-MA). One of the working

⁹ Fees are not calculated by the amount of waste, but based on a fiscal estimate. At the higher end, average monthly collection fee in Sofia is ca. EUR5-6 per household (or approximately EUR40/ton). Landfill gate fees range from EUR5-20/ ton, where internationally, approximately EUR20/ton is considered a minimum required level to operate a medium sized sanitary landfill site.

¹⁰ However, the plan was not yet available at the time this report was prepared.

¹¹ Does not include hazardous and inert waste; 2010 National Waste Management Plan. Warsaw. December 2006.

groups is devoted to waste management and is expected to considerably improve cooperation among central and regional authorities responsible for environment and regional development.

63. Polish municipalities are legally responsible to manage solid waste within their jurisdictions. However, the legal framework confers proprietary rights of the waste to the waste holder, who selects the collection service contractors. As a result, the private sector operates most of the economically viable routes and separates profitable waste streams for reuse, while public municipal utilities serve mostly the non-cost recovery share of the market.¹² Municipalities manage landfills, except for some regional landfills, which are managed jointly by inter-municipal associations, or regional public utility companies. Recycling is managed by private operators.

64. The Ministry of Regional Development (MoRD) has primary responsibility for establishing capital investment priorities in the sector and manages the structural funds to co-finance sector capital investments. Ministry of Environment (MoE) plays only a coordinating role. A National Environmental Protection Fund (National Fund for Environmental Protection and Water Management, NFEPWM), plus 16 financially and institutionally independent Regional Funds are implementing agencies for EU funds, and provide grants and loans for project financing. NFEPWM manages all projects above EUR25 million; Regional Funds manage all other projects.

65. Regulation, supervision, and enforcement capacities are highly fragmented among multiple institutions and levels of government. Municipalities are responsible for ensuring that private operators comply with landfill standards, but lack sufficient enforcement capacity and instruments, resulting in frequent open dumping. The regional governments, or Voivodships, supervise responses to complaints received at the municipal level. The Environmental Protection Inspectorates, which operate at the national level (Chief Inspectorate) and regional level (Voivodship Environmental Protection Inspectorates), supervise waste management practices. To monitor key target indicators, MoE relies mostly on implementation reports from Voivodships, counties, and municipalities, and information collected from other ministries. The NWMP 2010 expressed doubts that operators and public authorities understand or apply legal provisions in the scope of waste management, but recognized the lack of capacity to enforce them. Currently, the Government is discussing to establish an independent Environmental Protection Agency.

National Strategy

66. Strategic directions for solid waste management in Poland are outlined in national, regional, and local waste management plans (WMPs). A new 2014 National Waste Management Plan (NWMP) was prepared for adoption in late 2010. The Plan continues the policy directions outlined in the NWMP 2010, adopted in December 2006, which was the most recent policy document governing implementation of the national solid waste management strategy and provided the latest available data on the sector. Although the Ministry of Environment is mandated to develop policies, set priorities, and establish strategic direction for solid waste management, substantial discretion exists at the regional (Voivodship) and local (municipality) levels. Each of the 16 Voivodships prepared a regional plan, but only bigger cities and more advanced municipalities have drafted their own plans on upgrading waste facilities within their jurisdictions. Under Polish law, waste management plans

¹² In Europe, only Malta and Kosovo have comparable arrangements. Ireland has just brought a year long dispute between municipal authorities and private operators to the final court decision. A draft amendment to the legal framework which would also clarify the ownership of municipal waste is currently being discussed in the Polish Parliament, but has not been adopted yet.

must be updated every four years, but compliance is spotty; and most available plans suffer from lack of coherence among levels.

67. The NWMP specifies solid waste targets and outlines a general plan to achieve them, but leaves it to the regional WMPs to stipulate details. During 2005-2014, the 764 municipal landfills need to be reduced to 200 regional landfills, and the share of waste in these landfills will need to be reduced from 95.3 percent to 85 percent. By 2010, municipal biodegradable waste disposed in landfills should be reduced to 75 percent of amounts generated in 1995 (4381 tons), to 50 percent in 2013, and to 35 percent in 2020. The NWMP aimed to achieve 100 percent national coverage for waste collection services by 2007. However, most recent estimates reckon that no more than 90 percent of the population has formal waste collection services. The new NWMP 2014 continues the policy lines presented in the 2010 Plan. One of the stipulations requires voivodship waste management plans to indicate municipal waste management regions with at least 150,000 inhabitants; or at least 300,000 if construction of an incinerator is proposed. During 2007 and 2008, the voivodship plans defined 123 such regions, of which each is to be served by a regional municipal waste management plant. The National Plan indicates the kind of installations that should be constructed. Based on the waste hierarchy and the obligation to landfill treated waste only, the main goal is to build installations other than landfills.

Investment Cost and EU Funding

68. Despite substantial outstanding waste management issues, Poland has allocated fewer funds to the sector than Bulgaria and Romania. The 'Infrastructure and Environment Operational Program' for 2007-2013 has a total budget of EUR37.56 billion, of which EU assistance comprises EUR27.92 billion—the largest OP in Poland, and biggest-ever in the EU. EUR1.43 billion was allocated to Priority Axis 2 "Waste management and the protection of the earth"; of which EUR1.2 billion will be funded by the EU—only about 4.35 percent of total cohesion funds available to Poland for this period. Specific projects target management of household and industrial waste (79 percent), rehabilitation of industrial sites and contaminated land (17 percent), and risk reduction (4.0 percent).

69. However, the substantial ERDF funding available to Poland is still insufficient to cover all capital investment needs to meet EU targets. The Government anticipated that the funding gap would be bridged with equity from municipalities and commercial borrowing with interest rates subsidized by Environmental Protection Funds, plus private sector investments. The country has ambitious goals for increased private sector participation under the recently amended PPP law, to meet investment and solid waste management infrastructure needs. Of the PLN9.32 billion (EUR2.4 billion) allocated for investment projects in the NWMP, estimated PLN2.11 billion (EUR0.55 billion) is expected from the private sector. However, Poland lags other new EU members in creating incentives to mobilize private finance for environmental infrastructure; the sector is too dependent on public extra-budgetary Environmental Funds and EU instruments, insufficient for required investment levels.

70. Fund absorption in Priority 2 advances only slowly. By December 2008, no applications had been submitted to the EC. According to the Ministry of Environment, an indicative list of projects to be financed was prepared; and pre-agreements for 14 projects were signed. The first and only application so far was submitted to the EC in March 2009, and the Ministry of Finance was not expecting project implementation to start before October 2009. The majority of proposed projects now focus on waste-to-energy facilities (incineration) facing outspoken public opposition that additionally slows down implementation. There are serious concerns that proposals have underestimated the time normally required for lengthy planning and development periods for

incineration projects. It is not unlikely that only two of the projects may be financed during the current funding period and reallocation of funds may become necessary.

Table 5: Investment Estimates for OP Infrastructure and Environment in Poland, 2007-2013 (in million EUR)

	Community contribution	National contribution			Total	EU funds contribution indicator
		Total	Public	Private		
	1	2=3+4	3	4	5=1+2	6=1/5
Total OP Infrastructure and Environment	27,848.3	8,537.0	6,616.2	1,920.8	36,385.3	0.77
Priority Axis II – Waste Management and the Protection of Earth	1,190.0	210.0	210.0		1,400.0	0.85
Management of household and industrial waste (79%)	940.1	165.9	165.9		1,106.0	0.85
Rehabilitation of industrial sites and contaminated land (17%)	202.3	131.1	131.1		333.4	0.60
Risk prevention (4%)	47.6	103.5	103.5		151.1	0.32

Source: The Polish Ministry of Regional Development. 2006. *Operational Programme Infrastructure and Environment*. Warsaw.

Main challenges

71. Slow progress is primarily due to the unsolved question of who owns municipal solid waste, and limited local-level capacity to prepare and implement projects further creates delays. Overall, municipalities are saddled with less profitable waste streams or collection routes, have limited potential to generate revenues, but are required to invest in environmentally sound collection, transfer, and disposal infrastructure with substantial operating and capital costs.

72. Municipalities lack incentives to implement waste management plans, and have little enforcement capacity. Inter-municipal associations are responsible for implementing regional WMPs, but few are operational; and most Polish landfills do not meet EU standards. Unofficial figures estimate that up to 95 percent of waste is still dumped in non-compliant landfills, and the EC doubts that Poland will meet framework directive waste requirements by 2012: more than 300 municipal landfills fail to comply with EU standards and would need to close by July 2012. Local-level disincentives could be counteracted through higher-level action at the Voivodships, but lack of coordination between government levels delays project preparation. Regional governments in turn tend to point to municipalities' legal responsibilities for solid waste management.

73. Poland's policy to develop waste-to-energy schemes to leap forward towards disposal and waste minimization targets encounters strong opposition from the public and NGOs that are concerned by negative environmental impacts.

74. A general challenge is the scarcity of reliable data and information that hinders both national authorities and the European Commission. No unified monitoring system generates data required to estimate existing waste volumes, never mind verify progress against targets. As Member States are responsible for data collection, the EC, through DG Environment, can initiate data collection only after infringement procedures are triggered, to verify non-compliance with EU targets.

D. Croatia

Background

75. In support of EU accession, Croatia is reforming its waste management sector. The country generates an estimated 1.4 million tons per year of municipal solid waste, equivalent to 327 kg per capita annually for 4.4 million inhabitants, or an average of 0.90 kg per capita per day.¹³ About 93 percent of the population is covered by organized municipal waste collection and disposal performed by 199 municipal companies. However, Croatia's waste profile varies seasonally and geographically due to tourism, and can be as high as 1.9 kg per tourist per day in some coastal areas. Accurate data on waste flows and composition needed for more detailed planning and design are scarce because most official landfills lack a weighing bridge, and do not perform inventories.

76. Systems of separated waste collection have developed gradually in Croatia for paper, cardboard, packaging waste (glass, PET and metal), green waste, used batteries, medicines, oils, car tires, bulky metals, and construction materials; some recycling yards and «green islands» have been established. Croatia has introduced various environmental taxes on certain waste types including packaging, which has encouraged recycling and reuse. Tax revenues are an important source of funding for the Environmental Protection and Energy Efficiency Fund (EPEEF), and an incentive to return to solid waste investments.

77. A large share of generated MSW is disposed in landfills; most official landfills are non-sanitary although some EU-standard sanitary landfills are operational or under construction. Landfill restoration and closure began in 2004, and will continue for the foreseeable future since closures must be coordinated with new landfills constructed to EU standards. Many old landfill sites will become transfer stations and recycling yards; the rest will close within five years. In addition, over 3000 illegal dump sites have begun remediation and closure.

Investment Cost and EU Funding

78. Overall investment needs to establish regional waste management centers in Croatia are estimated at EUR397 million, including landfill sites, mechanic-biological treatment plants, transfer stations, and other supporting infrastructure. Funding is envisioned to be provided from EU IPA funds, the Environment Protection and Energy Efficiency Fund (EPEEF), from local and regional governments, IFIs, and private investments.

79. For the period of 2007 to 2011, EUR47 million IPA funds are available for waste management investments in Croatia. During 2007-09, an estimated EUR35 million was allocated to developing an integrated waste management system. Approximately 75 percent was EU contributions through the Instrument for Pre-Accession Assistance (IPA), the rest was public funding. Most funding will establish new county/regional waste management centers, the rest will be used to remediate highly contaminated sites ('hot spots'). During 2004-06, the EPEEF's first three years of operation, it allocated almost US\$9.0 million to remediate 139 illegal dumpsites. By comparison, US\$280.39 million went to remediate official non-sanitary landfills for municipal solid waste. The map below shows counties where waste management projects have been started or planned, and the major type of financing sought.

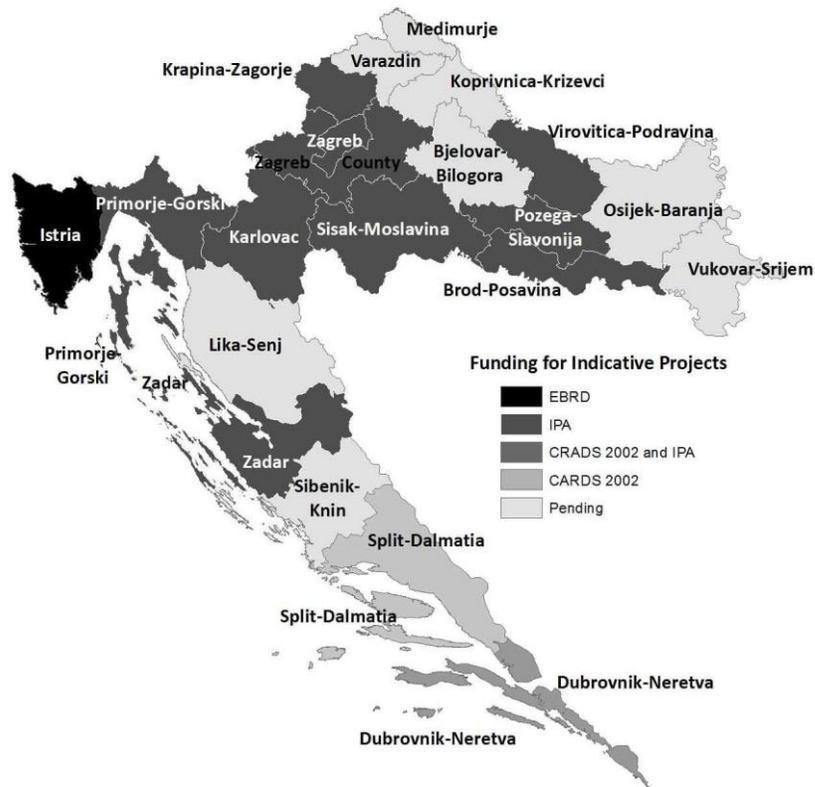
¹³ Ranges from 0.56 to 1.28 kg/capita/day.

National Strategy and Regulatory Framework

80. Several strategic policy documents were adopted: the National Environmental Strategy and Action Plan in 2002; the Waste Management Strategy of Croatia in 2005; and the 2007 National Waste Management Plan (NWMP), which sets key sector reforms. Key initiatives highlighted in the NWMP include the following:

- (i) Establish county or regional Waste Management Centers (WMC) across Croatia.
- (ii) Develop local waste management plans targeting integrated waste management solutions and waste minimization.
- (iii) Establish a financing plan for project implementation, including private financing sources and public-private partnership (PPP) structures.

Map 3. Croatia: Major Sources of Funding for Waste Management Projects



81. Croatia's primary legislation governing waste management is the Waste Act, updated in 2004, 2006, and 2008, to ensure iterative harmonization with the EU Waste Framework Directive. The 2008 version promotes avoiding waste generation and increasing separated waste collection to recycle and recover materials. Over 23 different pieces of secondary waste-related Ordinances, Regulations, and Government Decisions underpin the Waste Act. At end-2008, a new Public Private Partnership Law and a new Concession Law were adopted that define and regulate PPP arrangements, including those for the solid waste sector.

82. In EU negotiations, Croatia requests a transitional period until December 2015 for full implementation of Article 14 (polluter pays) of the Waste Framework Directive; and December 2020 for full implementation of Article 5 (waste by-products). However, transitional periods, including for sanitary landfilling, have not been finalized yet and are still under discussion.

Institutional arrangements

83. Government relies on three agencies for solid waste management: County Administrative Offices approve county-level waste management plans; Municipalities approve local waste management plans; and the Environmental Inspectorate issue and verify licenses and permits. In addition, the private Croatian Environment Agency (AZO) collects data according to the Waste Act and sub-laws, develops and maintains the national waste information system, prepares indicators and reports on waste management, and promotes public access to information.

84. Croatia's waste strategy promotes public private partnerships, and equal public subsidy, from different sources, for county-level and higher waste management centers. A new Agency for PPP was established under the new Law and allocated the entire spectrum of responsibilities including establishing a PPP projects register. County or multi-county level Waste Management Companies administer project preparation, including contracts for feasibility studies and technical designs; companies deliver services primarily through inter-county and inter-municipal agreements. A mix of public and private service providers collect, transfer, sort, recycle, and carry out pre- and final treatment of waste.

85. The Environmental Protection and Energy Efficiency Fund helps co-finance local-level waste management projects and sets requirements for resource distribution, such as remediating landfills, promoting waste reduction, waste treatment and waste re-use, among others. The EPEEF is the authorized authority for IPA waste investments; it administers and monitors use of EU Grant resources for waste management; and issues grants, loans, and guarantees as needed. The Ministry of Environmental Protection, Physical Planning and Construction (MEPPPC) is in charge of national budget finance and can instruct the Environment Agency to implement public communication programs.

Main Challenges

86. **Locating landfills and public opposition to siting new facilities, especially incinerators, remains a challenge.** The plan to establish a Zagreb waste-to-energy facility based on incineration has been met only with strong opposition. Almost every landfill and waste management site has had political or community opposition at one point or another. Public awareness and communication efforts will need to be substantially expanded in parallel with waste investment plans.

87. **Island waste collection is costly and logistically difficult to implement.** Croatia has over 1,000 islands with low permanent populations but high transient populations from tourism. Waste collection at these sites will be costly and logistically more difficult to implement; particularly as the Waste Strategy has committed to have no disposal facilities on islands but instead envisions using ferries for transporting waste to the mainland.

88. **Weak capacity to develop and manage projects among municipal waste management companies.** Municipal companies will require substantial institutional support and strengthening along with infrastructure investments in the system. Croatia still needs to develop a strong project pipeline for absorbing available funding. Although JASPERS can provide technical assistance to

municipalities, many projects are small in size so that support will be limited to not more than 12 projects. In tandem, environmental enforcement capacity will need further strengthening, particularly for control of illegal dumping.

89. **Inadequate waste flow and composition data deters private sector operators.** To attract the private sector and leverage financing, many operators will require guarantees for minimum waste volumes and composition in their agreements. In addition, sensitive karstic geology over a large part of the territory requires much higher levels of environmental protection and controls, and therefore higher costs for landfills.

90. **Household-level affordability is a concern.** Many Croatian households will struggle to absorb higher-cost waste management. While varying, this will be a particular concern for certain geographic areas with low income.

IV. CROSS-COUNTRY ANALYSIS: KEY ISSUES AFFECTING SECTOR PERFORMANCE

91. This chapter analyzes results to date and identifies major shortcomings affecting sectoral performance, now and in the future. First, the chapter reviews institutional arrangements in the sector across four countries and identifies strengths and weaknesses. It summarizes the main roles and responsibilities in each country along functional dimensions that shape performance of service delivery within a decentralized framework. Eleven dimensions have been selected to compare key features across countries, and against international good practice in the sector (Table 6). Second, the chapter takes a closer look at sector economics and financing, how current incentive mechanisms drive sector investment decisions, and how this affects medium- to long-term financial sustainability. This subsection will also analyze financing options, including private sector participation, recycling, and carbon finance.

Table 6: Functional dimensions within a framework of decentralized service delivery

FUNCTION	DESCRIPTION
Policy making	Who sets the main policy guidelines?
Legal framework	What are the key legal parameters in the sector? Who bears the main responsibility for municipal solid waste management? Who has the legal ownership of waste?
Regulation	Who regulates the sector? This includes the licensing regime, permits, standard setting, sanction mechanisms, etc.
Supervision	Who monitors compliance with the sector regulation? This includes verification of licenses, data analysis, regular testing, and other control measures.
Enforcement	Who enforces sanctions if non-compliance with set standards is detected?
Planning	Who plans implementation? Who approves/disapproves the plans? This includes planning for siting of landfills, choice of technology, preference of public/private operation, allocative mix of financial resources, etc.
Financing	Who finances service provision? This includes capital investments, wages, operation and maintenance, and costs associated with closing/remediation, etc.
Administration	Who administers the service? This includes bidding, contracting, and daily responsibilities
Service delivery	Who delivers (“produces”) the service? Public or private operators, or a mix; it includes collection, transfer, sorting, recycling, pre-treatment and final treatment. A public institution may have legal responsibility; a private operator may deliver the service.
Monitoring	Who monitors service delivery? This includes regular reporting, evaluation of outputs, data collection, statistics, and consumer feedback mechanisms.
Public communication	Who is responsible for financing, designing, and implementing marketing, education, and other public information campaigns?

92. Annex 2 presents the institutional arrangements adopted by each country to fulfill functions presented in the table above.

A. Institutional arrangements and sector planning

93. Influenced by EU practice and other EU country examples, the legal framework and institutional set-up in the solid waste management sector is similar in Bulgaria, Croatia, Poland, and Romania. Policy formulation is primarily the responsibility of the Ministry of Environment or a similar agency. In most countries, other government agencies with varying degrees of executive power and mandated responsibilities are also involved in regulating the sector, enforcing environmental standards, promoting regional coordination for solid waste management, reviewing and issuing permits, and identifying capital investment priorities. National Waste Management Plans outline each country's policies and set sector strategy. Local-level responsibility for implementing solid waste management is generally decentralized to municipalities, which carry out NWMP-mandated tasks.

94. As prescribed by EU directives, local waste management authorities influence legal, economic, and political aspects of resource and waste management; collect waste from households and industries; ensure efficient waste separation and collection; raise citizen awareness; and accept feedback from local-level stakeholders such as waste producers, including residents, manufacturers, retailers, associations. Local governments are also producers of waste and expected to be a model of good waste management practices in their communities.

95. Key institutional challenges arise from NWMP planning and execution, translating national goals to local-level implementation and achieving progress toward meeting EU directives. The following section details these challenges.

Policy making and legal framework

96. **Municipalities bear legal responsibility for solid waste management and must be the main driver for good service provision.** All countries have mandated municipalities to ensure regular domestic waste collection and transport to disposal or treatment facilities. Local authorities have incentives and knowledge to provide good services to citizens. However, in some countries, competencies are unclear in the legal framework. In Poland, waste generators own the waste and can contract waste collection services to private operators who compete *within* and not *for* this lucrative market, leaving public utilities only with financially non-viable routes. In this arrangement, almost unique to Western Europe, municipalities cannot enforce local waste management plans, including routing of waste collection services, and are stripped of a vital source of municipal revenues.¹⁴

97. **Waste management strategies should ensure consistency across government levels.** This is often not the case in these sample countries. In particular, roles are blurred among regions or counties, and ministries of regional development. For example, Poland's institutional framework conveys substantial discretion to the 16 regional governments (Voivodships) to manage their waste strategies. Often, priorities differ among Voivodships, and lack of coherence among different government levels leads to lack of clear sector policy guidelines for municipalities. In addition, the Ministry of Regional Development has lead responsibility to prioritize capital investments for solid waste management, while the Ministry of Environment is responsible for sector policy, which

¹⁴ In Europe, only Malta and Kosovo have comparable arrangements. Ireland has just brought a year long dispute between municipal authorities and private operators to the final court decision.

multiplies inconsistencies. These inconsistencies undermine cost efficiency, which depends on integrated systems and robust regional arrangements.

98. **Integrated systems should rely on robust regional arrangements.** Regional sanitary landfills and treatment facilities are the backbone of integrated, environmentally sound, and financially viable solid waste management. To address the institutional challenge of developing integrated regional-level systems, the legal framework should provide for strong, functioning inter-municipal entities, such as associations, to establish or contract operators; or, as in Croatia, convey solid waste management legal obligations to regional authorities (counties). In Bulgaria, regional associations were intended to lead regional waste management planning and administration, but the regional associations were created at the national level, and the associations are weak, barely operational, and face strong opposition from local authorities. In Poland, regional self-governments have substantial discretion, including legislative power, but in practice this has led to overlap of responsibilities leaving municipalities and regional associations reluctant to act to fulfill their roles. Complexity is multiplied by numerous other stakeholders, including the private sector, and NGOs.

Regulation, supervision, and enforcement

99. **National-level enforcement is critical for sector compliance.** Municipalities acting alone cannot enforce required environmental standards. Typically, strong, independent regional and national institutions should be responsible for enforcement. Regulatory regimes in all four countries appear fully in line with EU requirements. Environment ministries set sectoral standards, establish a licensing system, and issue permits; although the EC reports that environmental authorization procedures generally proceed slowly in the four countries. De-concentrated, sometimes independent regional directorates or environmental inspectorates support MoEs in supervision and enforcement; they assess applications and verify compliance through field visits to disposal and treatment facilities.

100. **Strong enforcement is key to successful SWM compliance.** International lessons learned in Ireland and Slovakia point to the importance of strong enforcement regimes. Bulgaria, Croatia, Poland, and Romania have good regulatory regimes, but enforcement capacity remains too low. Typically, the problem lies with regional directorates, vital to enforce sector regulations, but still lacking sufficient staff and skills to cope with the overwhelming volume of *supervision* activities, much less to forcefully implement sanctions for non-compliance. In Bulgaria, 16 regional environmental inspectorates supervise 55 waste management regions and report to the Department of Waste Management at the Ministry of Environment, which employs only 17 people to supervise compliance with the EU framework directive on landfills. By end-July 2009, Bulgaria was facing an insurmountable task: to enforce closure of more than 200 non-compliant landfills, to ensure that waste dumped at those sites would be transported to one of the 27 functioning regional sanitary landfills, many of which are distant and unprepared to accept waste from other locations, and to accomplish all of this with very limited enforcement capacity. By comparison, in Ireland, with a smaller population, the Environmental Protection Agency has 340 employees; 85 percent are technical positions.

101. **Limited monitoring and data collection hamper enforcement.** Across all countries, operators are obligated to report to the municipal or regional contracting authority, which transmits data to the Ministry of Environment (Bulgaria and Romania), or an Environmental Protection Agency (Croatia). Often, national statistical institutes store and process the data. However, SWM efforts in all countries suffer from lack of reliable data, particularly Poland. Reporting obligations, data collection, and data processing are neglected. Access to data remains poor, and public debates are not based on reliable information. For example, most landfills operate without weigh scales and therefore cannot report accurately on waste streams.

102. **Institutional fragmentation undermines enforcement.** Regional enforcement structures are hampered by institutional fragmentation of responsibilities, in addition to suffering from limited capacity. In Romania, the Ministry of Environment through regional offices, and the Ministry of Administration and Interior through the National Regulatory Authority for Community Services and Public Utilities, share county supervision responsibilities; this leads to gaps, overlaps, unclear responsibilities, and weakened enforcement.

Planning and landfill siting

103. **Quality and coherence of waste management plans vary.** Although, in principal, subsidiary planning is good practice, the quality and coherence of waste management plans vary widely, leading to uneven results on the ground. All four countries have National Waste Management Plans, usually spanning four years. Plans translate strategic priorities into actions, specify sector fund allocation to regions, outline treatment technology preferences, and identify preferred locations for final disposal. The NWMPs are often comprehensive in scope, but isolated from local realities. Regional plans exist only to a limited degree. Some municipalities develop their own plans, in particular bigger cities and affluent urban metropolitan areas. However, smaller, poorer, and rural municipalities typically have no waste management plans.

104. **Region or county governments play a crucial role in integrated SWM planning.** National plans can establish overall strategy, but since the system relies on regional disposal and treatment facilities, planning must include inter-municipal or regional governing bodies because successful results require local stakeholder ownership and support. Most countries have recognized this. Regional-level governments, counties in Croatia, and Voivodships in Poland, have legal responsibilities and obligations. In Romania, the Environmental Protection Agencies develop regional waste management plans, and in Bulgaria, regional associations are supposed to lead the planning process.

105. **However, regional plans require strengthening and ownership in all four countries.** Effective plans require operational champions, and regional- or inter-municipal-level implementation capacity. Voivodships should predominate in Polish regional waste management planning, but few inter-municipal associations have been set up to take on the task. Authority is delegated reluctantly; coordination between regional governments and municipalities is sporadic; and the system is riddled with inconsistencies and disincentives. Bulgaria devolves planning authority to the regional level through Regional Associations, and Romania through Regional Environmental Protection Authorities, but in practice no real ownership yet exists for solid waste management planning at that level. National authorities should encourage regional- and municipal-level planning and ensure coherence and consistency across national, regional, and local plans.

106. **Site selection for regional landfills remains biggest obstacle to implementing planned investments.** Public consultations require more than the lip service that has been observed in these four countries. Successful regional implementation of solid waste management requires thorough planning, technically sound EIAs, and extensive public consultation and outreach to counteract NIMBY-related delays. There is enormous potential to improve public involvement in planning and landfill siting required for solid waste management. Typically, local communities are reluctant to accept outside waste, but inter-municipal systems for waste management require a regional landfill site. Although all four countries have established procedures for public engagement, primarily at the regional level, it is unclear how these are applied in practice, and to what degree the public gets actively involved in the landfill siting process.

107. **Weak landfill site selection procedures result in substantial amounts of lost time and financial resources.** Local communities have opposed almost all proposed waste management sites, according to reports in the Croatian press. Bulgarian and Romania officials reported substantial public resistance to regionalized investments. Officials from DG Regional Policy reported significant problems during contract tendering due to environmental permit shortcomings, questionable Environmental Impact Assessment quality, and securing legal title to land. Local government developers report frustration with the “chicken and egg” dilemma: deciding how far to proceed with site selection that might be derailed—by strong opposition from local citizens, or by the instability of local politics and a constantly changing cast of public officials engaged in decision making. Often, landfill site selection is perceived to require first a “political” solution, and second, a technically sound iterative siting process. However, political cycles are short compared to solid waste investment planning cycles, so developing strong support among key local stakeholders should be integral to each step of the iterative siting process, to reduce the risk of solid waste investment planning delays.

108. **Site selection alternatives should be assessed up front.** Most national Environmental Impact Assessment (EIA) legislation calls for an “alternatives” analysis; which means reporting on and reviewing site alternatives. However, across the four countries, alternatives are not used strategically in the consultation process but it is common practice to use EIA only *after* the site is selected, due to strong reliance on politically based siting decisions. In most countries, the Strategic Environmental Assessment did not clearly specify that the EIA must be used for siting waste management facilities, because the focus was primarily on larger planning strategies. Political pressure on the site selection process weakens this part of the EIA document, which often lacks rigorous comparison of technical merits. Instead it is used to report retroactively on sites to justify the selection process.

109. **Opposition to incineration schemes requires broader and more intensive consultations.** In Poland and Croatia, initiatives have started to develop waste-to-energy schemes based on incineration. This technology is widely used in other EU member states and high standards of environmental control have developed a proven technology. However, there is strong public opposition to waste-to-energy schemes as perceptions are often based on past experience with poorly performing incinerators and anxiety about negative environmental impacts, particularly emissions to air. Carefully scheduled, inclusive, transparent and often time intensive consultations are required that inform all stakeholders of benefits and risks and involve the public in planning procedures and decision-making.

110. **Services should be administered at service-delivery level.** All four countries attempt to follow this principle; municipalities are legally responsible for ensuring waste removal and transport within their administrative boundaries so they contract private operators or publicly owned service companies for waste collection. Only Poland is an exception, because waste ownership conveys responsibility for contracting collection to waste owners. In all countries, regional entities are supposed to administer final disposal and/or treatment facilities, including inter-municipal associations, regional public utilities, or other sub-national authorities.

Administration and service delivery

111. **Service delivery modes include public and private operators.** Solid waste management services generate revenues and have broad potential for private sector participation (PSP) at each step: collection, transfer, recycling, treatment, and disposal. Across the four countries, private operators are contracted for some or all of these services. Some service provision is strictly public, strictly private, or a mixture. All countries have forms of private recycling markets; Bulgaria has the most active recycling industry with six private operators. Many cities and bigger municipalities

contract out collection and transport services to the private sector; but many municipalities have public utility companies that collect and transfer waste. Public utilities operate most landfills, despite private sector interest where profits are possible. Incineration plants and other waste-to-energy facilities are almost exclusively PSP-run, because the technology requires specific expertise and significant up-front investment.

Box 1: Dublin, Ireland Landfill-Siting Experience

The siting process for Dublin's Arthurstown landfill was protracted, political, and resulted in extraordinary concessions and costs to appease strongly opposed citizen groups. The final site selected was a former quarry, outside Dublin City jurisdiction in a relatively affluent neighboring suburban/rural area—County Kildare, famous for breeding high-quality race horses. Dublin City Council purchased the site in 1992, and opposition from the local jurisdiction, Kildare County Council, immediately manifested in a refusal to grant permission to develop the site. Two years later, the Dublin City Council won a lengthy legal appeal to this decision at the local court, subject to agreement on 26 site mitigation conditions. The Kildare County Council continued to oppose the decision and finally succeeded in elevating their opposition to the High Court in 1996, and the Supreme Court in 1997. Both higher courts upheld the original lower court decision to allow construction of the landfill in a neighborhood where citizens remained opposed.

Community concerns about the site included increased traffic, unsightliness, uncontrolled trash and wind-blown litter, attracting pests and vermin, potential fires, and unpleasant odors. In response, site mitigation measures included: (i) establish a local community interest group; (ii) an expensive agreement to bale waste before transporting to the site; (iii) site bailing/ transfer stations away from the landfill site; (iv) dawn-to-dusk patrolling for vermin by trained birds of prey; and (v) traffic rerouted around the local village of Kill with a vehicle tracking system. Landfill operations teams routinely respond to complaints and local press enquiries; and have developed extensive public information resources, including a video on landfill operations, photo boards, brochures, and a 3-D educational model. Estimated additional costs of baling waste in response to community pressure is about 100 EUR/ton.

Lessons and Follow-up include:

- Substantial time must be dedicated to public consultation, outreach, and awareness.
- The more people understand, the more accepting they become. Public perceptions are typically based on little factual technical information, so outreach and education are critical.
- Remain transparent and open to the community at all times.
- Siting a waste disposal facility outside the political jurisdiction where the waste is generated increases political risk and opposition, and is not recommended. Dublin City Council resolved to site all future waste facilities within its own political jurisdiction.
- Ireland decided to “de-politicize” the siting process by retracting local politicians’ responsibility for decisions on siting landfill and waste management facilities; lawmakers agreed that this was the only feasible way to move forward.
- Ireland EPA developed a Landfill Siting Manual, now used nation-wide, which promotes proactive public involvement during each stage of landfill lifecycle, including site selection.

Monitoring and public communication

112. **Public feedback and complaint mechanisms are not yet widely institutionalized.** Siting regional sanitary landfills heavily depends on proactive public consultation and information; and reducing landfill waste can only be achieved with public education campaigns to promote the

individual and collective benefits of sorting and recycling. So far, the opportunity to reduce political risk through informed public debates during siting and operation of regional landfills is insufficiently recognized. Instead, industry active in the more profitable part of waste recycling appears to be the main driver of public communication campaigns to extol the benefits of sorting and separating waste. Some Environment ministries lead national public communication campaigns, but environmental funds, where they exist and are functional, such as the EPEEF in Croatia, are more prominent in public education.

B. Economic and financial sustainability

113. **EU policies on waste management are expensive.** Costs of solid waste management in the other EU member countries typically exceed EUR100 per ton. Even though transition periods of weak enforcement mean that costs will climb only gradually to these levels, the gap is wide between current conditions in these four countries—most collected, unseparated waste ends up in uncontrolled dumps—and full EU compliance. Yet none of the four countries has developed plans to tackle this absolutely critical issue.

Lack of data

114. **Almost no reliable data are available at the national level.** In particular, no reliable data are available on costs and revenues, a basic requirement to organize a national transition to EU compliance. As noted earlier, enforcement of environmental norms, monitoring, and data collection is limited, in part because it was never recognized that a municipal solid waste management regulator was needed, unlike other services such as water supply, sewage, or electricity. Typically, environment agencies do not collect waste data, but if they do, no clear standards exist to unify collected data. On the revenue side, fees for waste collection can be part of local taxation, such as in Bulgaria; can be collected directly by a private operator, e.g. examples in Romania and Poland; or sometimes fees are included in general local taxes. When municipalities provide waste services directly, costs are often untraceable within municipal accounts that lack cost center accounting and include un-reconciled arrears. Private operators, in turn, rarely disclose revenues.

115. **Available cost and revenue estimates vary widely across sample countries.** According to interviews during site visits, tipping fees range from a few Euros per ton, e.g. in Gorna Malitsa (Bulgaria), a town of 15,000 on the periphery of Sofia, to about EUR40 in Zagreb (Croatia).

Revenues do not cover costs

116. **In many cases, local tariffs do not appear to cover recurring costs.** As a fee based service applying the polluter-pays principle, current revenues for waste collection and landfilling should cover all cost for operation and maintenance, including the cost for landfill closure and re-cultivation. All four countries have applied this principle, but most tariffs are too low to reach cost-recovery levels. Typically, tariffs are set at the local level, but municipal councils resist increasing fees due to low willingness to pay in the population. Potential for cost reduction have not been fully explored, and potential efficiency gains from private sector participation are not yet fully leveraged. In Poland, the unresolved issue of waste ownership under prevailing legislation diminishes sector financial sustainability because private operators pocket earnings from waste collection in profitable areas, while public municipal companies mostly serve the less profitable routes. Private operators, where they exist, usually collect sufficient revenues to cover current operations, but rarely enough for investment because most PPP contracts included an upfront subsidy to cover initial investments, but no reserve mechanisms for future investments. For landfills, the up-front subsidy from IPA or other

pre-accession funds typically covered the first cell or two, but after these cells are full, the future of the landfill is unknown. Thus, operating costs appear to be covered but in many cases they are not.

Attention focused on maximizing investments, not economic sustainability

117. In the four countries, national strategies focused on investments required to meet accession treaty targets, in particular on securing absorption of dedicated EU grant funding. This strategy aimed to maximize large investments in the shortest time, but its success among countries has varied—Poland the least and Bulgaria possibly the most likely to absorb significant funds. However, this strategy has undermined medium-term economic sustainability.

118. **First, a short-term focus on capturing grant resources for “hard” investments is a sub-optimal use of resources.** While this strategy can maximize resource inflows into the local economy, it also provides incentives for economically sub-optimal investment size. According to EU officials, investment costs per capita were particularly high during the first round of grant applications received for wastewater investments in Romania and Bulgaria. Another example of this is the number of inhabitants per landfill; in Bulgaria, almost half the 23 regional systems established to date serve fewer than 100,000 people—much lower than generally seen as economic minimum; and many of the 55 landfills planned will not exceed that average. By constructing more landfills than necessary, Bulgaria avoids difficult inter-municipal negotiations around site selection, but incurs higher than necessary future operating costs. In 5 to 10 years, reinvesting in additional cells without the benefit of structural grants will likely be unaffordable and this approach will need to be revised.

119. **A focus on structural grant absorption eclipsed sustainability.** All investments in solid waste infrastructure with support from EU assistance are prepared based on cost-benefit analyses (CBA), which are mandatory to apply for EU structural grants. The CBA methodology establishes, in net present value, the portion of the system’s total cost comprising both investment and operation that cannot be covered by generated revenues. This uncovered portion is the funding gap of which an agreed percentage, usually 80-85 percent, will be financed by EU grant funds. Assuming that revenues from users cannot be raised above a certain socially acceptable level, an affordability analysis determines the maximum tariff level to be used for the funding gap calculation. This affordability analysis is based on national parameters, which are often very low, such as in the example of Romania where the lowest income decile was used as reference point. Then, the financing percentage is applied to the funding gap, not to exceed the total amount of eligible costs, which in practice include almost only investment costs. Since funding gaps are usually large, the greater the initial investment, the greater the grant. Because, for macro-economic reasons, grant absorption in itself is an objective, the system skews incentives towards larger investments with higher expenses for operation and maintenance at the cost of long-term sustainability of these investments.

120. **Counter examples arise from countries that have successfully transitioned to EU-compliant waste management systems without using structural funds for investments.** Ireland used substantial grant money to prepare investments: undertaking studies, hiring long-term consultants, carrying out public education, outreach, and consultations to lower the political risks inherent in increased SWM costs, and technical assistance to develop local planning capacity (see Box 2). Ireland financed disposal investments primarily through PPP arrangements without EU funding, but with a revenue guarantee from local governments. Under this arrangement, the waste management system must generate sufficient revenue to cover total costs, including investment costs. Slovakia (see Annex 3) financed SWM investments almost entirely through borrowing and private sector equity investment, under financial incentive mechanisms—the landfill tax—that takes total cost into account.

121. **Second, none of the four countries have developed plans to gradually increase revenues to cost-recovery levels for the WM system.** For example in Romania it was agreed that the tariff level used to compute the funding gap for the CBA (i.e., the affordability analysis) would be set as 1.8 percent of the average household income in the lowest income decile, the poorest 10 percent. This was translated into mostly flat tariffs. Existing plans would need to switch to affordability mechanisms that target subsidies to the poor, while maximizing revenues from users who can afford to pay, instead of sharing scarce public funds equally among the whole population. The current use of affordability limits does not permit such differentiation.

Box 2: EU role in municipal waste management in Ireland: Setting targets and providing funds

In 1986, Ireland had essentially around 300 uncontrolled landfills, and no waste separation at source for its population of six million people. By 1995, only 95 landfills remained, but still only 8.0 percent of municipal waste was recycled. In 1996, the Waste Management Act was passed and transposed into government policy, followed in 1998 by a strong public information campaign, “Changing our ways”. The series of national and regional programs that followed kept raising the bar and transforming the waste operations system. By 2005, 36 percent of waste was recycled, close to EU15 average and better than Finland, France, the UK, Greece, and Portugal. Increased EPA enforcement prompted closures (39 landfills remaining in 2002); imposed high fines, and routinely brought infringement cases to court.

The consensus is that EU policies brought about this transformation because it would have been unacceptable for Ireland to infringe on European environmental norms. The Waste Management Act enshrined the EU Waste policy hierarchy (waste prevention and minimization, landfill diversion through combined reuse, recycle, and energy recovery). National waste targets mirrored EU programming periods (to 2013). In addition, during the first phase, strong enforcement of effluent norms raised technological costs for landfills, then recycling and waste-reduction targets came into effect, bringing about financial incentives such as a EUR 20/ton landfill tax, plastic bag levies, a environmental fund, and finally a “pay-by-weight” system—all of which made landfill disposal less attractive.

At national level, EU waste targets were transposed by combining planning (National Waste Management Plan); enforcement (EPA monitored compliance); and financial incentives (landfill tax). However, in Ireland the waste management sector emphasized compliance and incentives. During deregulation and privatization during the 1980s and early 1990s, Irish citizens could legally dispose of waste however they wanted to; private operators competed in the market, rather than for the market, using lowest-cost disposal. Given a lack of local enforcement capacity using a waste management plan, enforcement using penalties such as fines or taxes was more successful in Ireland. Another noteworthy aspect of EU waste policy implementation in Ireland was the quality of progress monitoring, including an annual progress report toward national targets that forecasted implications of the current situation for 2013—a useful tool to draw political support.

In other EU countries, local authorities relied on traditional planning and public investment approaches, such as regulating solid waste disposal through waste management contracts.

There is a need to organize the economic transition to achieve financial sustainability

122. **Pure operating costs are still much lower than in western EU countries, even where EU-compliant investments have been made.** Site visits revealed that landfill specifications matched EU standards on paper but are not equal to the quality found in more affluent western countries. Most current investments are funded by the EU through IPA or cohesion funds, or various donor funds, but funding usually covers only the first phase of investments for maybe five years. Thus, when

international grant funding becomes scarce, large tariff increases or unsustainable borrowing will be inevitable, since it is unlikely that donors would provide more grant funding for landfill capacity expansion after financing the initial upgrade from a dump site to a compliant landfill.

123. **Existing investments are also at risk.** Maintaining solid waste operations according to EU norms is expensive, even with less stringently enforced norms. If revenues do not match increased operating costs, EU-funded investments might be at risk from inadequate maintenance, which could mean that landfills deteriorate back into non-compliance.

124. **Clear plans are needed to transition to higher revenues.** This requires national-level cost monitoring and strong public outreach. If investments are made using grant funds without a parallel raise in tariffs, it will be politically difficult in the future to raise tariffs to sustainable levels. However, if tariff increases are accompanied by higher quality service and disposal, the public is more likely to accept rising user fees as justified. This offers a window of opportunity that needs to be accompanied by vigorous public outreach and education. Bulgaria and Poland are facing the biggest challenge, because they currently have very low tariffs. Tariff increases are normally difficult to achieve, and clear improvements in performance of the waste system or the quality of infrastructure could provide the opportunity to increase tariffs and decrease gaps with full cost recovery. Often these opportunities are not seized. Often, in public perception tariffs are expected to be lowered when investments are supported by EU grants. Therefore, continued information to the public about real and long-term waste management costs is a vital part of tariff increases and efforts to achieve financial sustainability.

125. **Contract design shapes service delivery performance.** Service contracts specify performance standards, risk allocation, and revenue-sharing agreements for public or private contracted operators. Service contract specifications determine whether private operators are interested, and whether service delivery levels satisfy users. Successful service contracts require high-level knowledge and expertise at the contracting authority, which highlights the importance of strong capacity at the service administration level. Policymakers typically have ambitious plans to leverage private finance and expertise, but tend to overestimate private sector interest. If risk perception is high and revenue potential is low, private operators cannot be mobilized.

Improving conditions for private sector involvement could help

126. **The level of private sector development in Poland, Romania, and Bulgaria can be a strength.** This is far less so in Croatia which still mostly relies on municipal companies inherited from the former Yugoslavia. The private sector has also proven able to invest, as some examples in Romania document. A review of the conditions of private sector engagement would be valuable and could provide lessons to improve the quality of contracts and tendering procedures, possibly leading to increased cost effectiveness. At the same time, municipalities often lack the capacity to adequately manage contracts.

127. **EU involvement has paradoxically dampened the initial growth in the use of private sector participation.** There is a fundamental problem in trying to mix Private-Public Partnerships, which help attract private sector investment for infrastructure, and can help bring down costs, with the use of EU funds. EU grants usually finance initial investments and have to be fully disbursed within a short time frame, while PPP models payment covers services delivered in the operation phase (see Annex 4). The challenge thus becomes to combine payment for inputs (investment) with payment for services. To achieve financial sustainability, countries will need advice on how to tackle this mix, and best use PPPs.

Environment funds could be a useful tool

128. **Environment funds can leverage sector financing.** Environmental protection funds can collect revenues from landfill taxes and other waste fees, co-finance sectoral capital investments, support recycling activities, finance public communication campaigns, and strengthen enforcement capacities. Croatia's EPEEF has become a key institution in shaping financing to the sector. The EPEEF generates significant revenues and reinvests resources in integrated waste management projects through co-financing; it has begun to administer IPA funds, and can issue grants, loans, and guarantees. Poland's 17 EPFs aim to leverage private sector funding for solid waste management projects by subsidizing commercial interest rates, but have not achieved substantial impacts due to their fragmentation. Bulgaria has not established an independent environmental fund, but collects and reinvests revenues from fees through the Public Environmental Enterprise—a branch of the Ministry of Environment operating within the same budget envelope, but leverage in the sector appears weak. Romania has set up a fund, but it does not yet affect financing of solid waste investments.

Implications of the global financial crisis

129. In general, systems that generate revenues attract financing. However the global financial crisis has diminished local government ability to find financing for a public service investment with inherent risks that might put it at the margins of attractiveness for the private sector. For example, after the onset of the financial crisis, Croatia found it difficult to attract interest from large operators even for a workshop to introduce the Northwest Region Waste Management facility investment. Therefore, PPPs are now being considered by some countries in an opportunistic manner, depending on the local market, as a way to attract financing. Governments must work on reducing investment risks in their solid waste sector. Starting point are very basic technical improvements such as collecting accurate information to increase knowledge and predictability of waste flows. Further reforms need to aim at reducing financial and regulatory risks.

130. When private sector investment is not feasible or affordable, many municipalities should be able to borrow commercially. Until the global financial crisis dried available funding, many municipalities in Poland and Romania were accessing commercial loans in strong domestic municipal lending markets. In Croatia and Bulgaria, in principle, there are no obstacles for local governments to raise commercial financing; examples of local government borrowing exist, although less so than in Poland and Romania. But undoubtedly, the crisis has taken a toll on municipal financing markets and solid waste was hit harder than other municipal services such as water because perceived contractual risks are higher and profitability more marginal. It is anticipated that the situation will improve as municipal revenues recover and bank liquidity returns. Meanwhile, support to municipalities for the co-financing share of EU grants is crucial, and the EIB in particular has made available substantial funding.

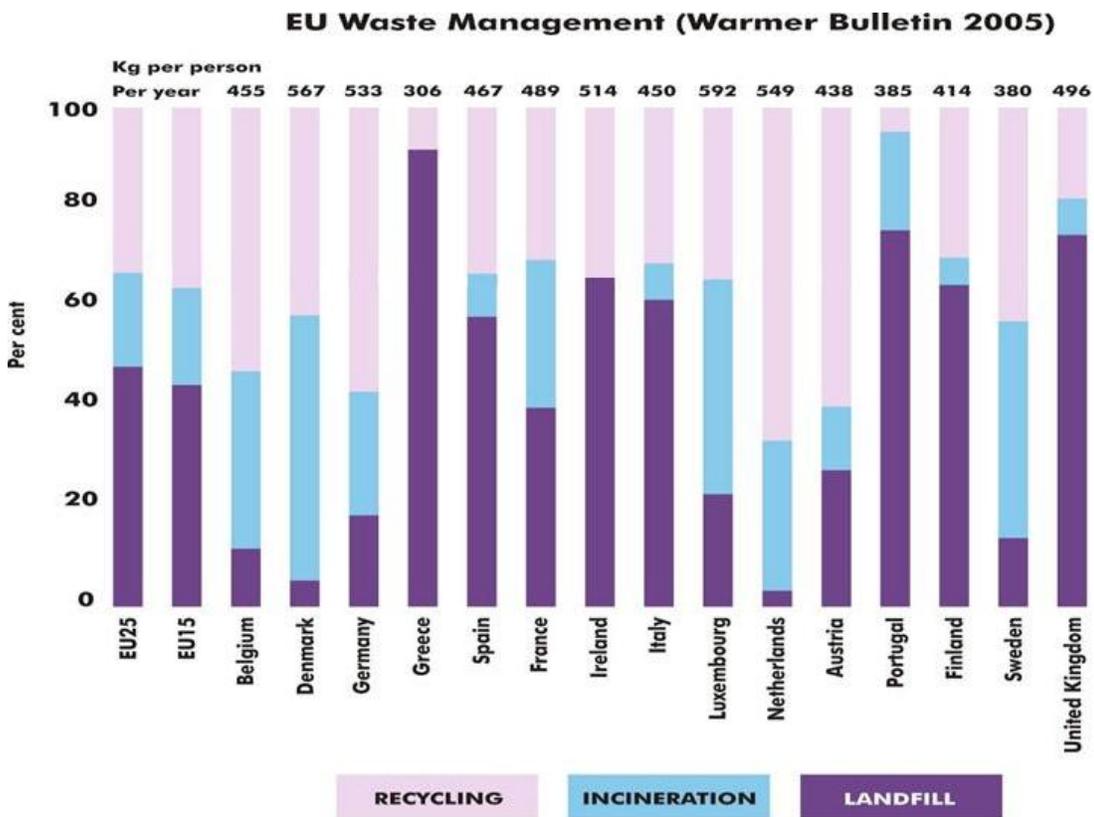
Waste Recycling and Carbon Finance

131. Recycling and carbon revenues might also improve sector financial sustainability. Carbon finance, in particular for landfill gas capture and separate treatment of the biological waste fraction e.g. composting, can provide additional revenues to the sector. In practice, carbon finance hardly played a role in recent improvements to the waste management infrastructure and its applicability is uncertain in Bulgaria, Croatia, Romania and Poland. Main reason is that Landfill Directive regulation implies landfill capture be considered as a baseline case. Therefore, schemes in other regions that are generating carbon finance through gas capture and flaring cannot not be considered as 'additional'

carbon emission savings for EU member or candidate countries. Landfill gas usage, e.g. for electricity production, is only viable for large landfills. The potential of carbon finance could be further tested in view of developments of instruments after the end of the Kyoto Protocol period (see Annex 5 for possible mechanisms). The European Emission Trading System (ETS) is designed for industrial and energy sector facilities and has, so far, little relevance for solid waste management in the countries of this study.

132. Except for Croatia, recycling in the sample countries follows a typical pattern of primary focus on relatively valuable recyclables for which—with some support—schemes can be fairly easily be introduced by the private sector. Most of the larger cities have systems with containers at strategic locations for the public to bring materials such as glass, metal, plastics and paper. Its main virtue is to lower overall waste management costs by reducing the quantity of waste that needs to be disposed of. Typically, these schemes pay for themselves and all sample countries have a well-developed private sector in this business. Croatia has taken further steps by taxing manufacturers of certain products or packaging materials, such as tires, beverages, and using these revenues to support waste management initiatives. Drop in global recycled material prices has hurt. Social issues do not seem to have much traction, such as impacts on relatively large Roma population working in this sector.

Figure 2: Waste Reduction and Recycling (Landfill directive, EU Waste Strategy) – distance to targets (2005)



Source: Warmer Bulletin 2005

133. Some initiatives have been noticed in the countries of this study to engage with the population more directly and develop practices of source separation and segregated waste collection from households, but these initiatives are very limited. As a result recycling impacts have been limited in terms of fractions of total waste streams or EU targets for recycling. Data is limited and estimates single digit percentage levels, e.g. Eurostat reports less than 1 percent for Bulgaria and 7 percent for Poland in 2008. Other figures, e.g. from ETC/RWM give 20 percent for Bulgaria (2006) and 31 percent for Romania (2005) based in indirect figures, i.e. the difference between waste generation and other disposal routes than recycling. Despite these uncertainties in reliable data, it is obvious that further effort in public outreach, introduction of waste separation at source and further investments in waste treatment are needed in the coming years to develop the waste management systems in compliance with waste EU recycling targets. The course of action in Croatia could be an important step in the direction of these targets, but the scheme is still relatively young.

134. Figure 2 illustrates the progress EU member states have made to meet both requirements of the Landfill Directive to bring less organic waste to landfills and to improve waste recycling to levels of 50 percent (2020). While earlier member states generally can be considered to have met the technical requirements of the Landfill Directive, i.e. environmental control measures, figure 2 shows that that waste minimization and recycling targets are not only a challenge for new member states. Recycling achievements and the phasing out of landfilling vary widely across all member states.

V. CONCLUSIONS AND THE WAY FORWARD

135. The preceding chapters have identified major shortcomings in implementing solid waste management strategies and progressing towards targets of the EU *aquis communautaire* in Bulgaria, Croatia, Poland, and Romania. The following section draws lessons on how to address cross-cutting issues identified in the four countries and how to improve sector performance. This final section presents suggested areas for action, but is by no means exhaustive. The chapter will provide policy recommendations to optimize performance in key dimensions, but will not make recommendations how to develop country-specific strategies. An in-depth analysis would be required to tailor approaches for each country. Findings of the report were discussed with representatives from the European Commission, including DG Regional Policy, DG Environment, and DG Enlargement, who highly welcomed the report and agreed to its main findings. However, based on this analysis, the report aims to seek a broader dialogue with EU and country representatives to prioritize targeted interventions.

A. Looking ahead: approaches to optimize sector performance

136. The analysis suggests improvements along three key dimensions:

- (i) Creating favorable institutional arrangements;
- (ii) Operationalizing the national waste management plans; and
- (iii) Achieving medium-term economic and financial sustainability.

Dimension 1: Improve the institutional arrangements

137. **Build strong enforcement capacities.** Compliance with the prevailing environmental legislation is usually best enforced through legally independent bodies that may act on their own initiative, and take appropriate enforcement actions through fees and other sanctions, including prosecution. Enforcement has the clear objective to avoid possibly high fines as a result of EU infringement procedures for non-compliance; but in addition, effective enforcement is essential to set the right incentives for the responsible authorities and their contracted operators to plan, implement, and maintain an integrated solid waste management system. Also, it provides to the public a mechanism to deal with complaints from citizens; and in the long run increases acceptance for final disposal and other waste treatment solutions.

138. **Increase local ownership.** Ambitious national waste management plans have not yet been fully translated into regional and local plans. Local authorities, the main drivers for implementation, have yet to assume the level of ownership required for ambitious plans that include significant infrastructure investments, politically sensitive landfill site selection, and tariff increases. Building municipal-level momentum will require additional incentives for better performers, and increasing sanctions for non-compliance and worse performers; but also better public communication and outreach campaigns to engage the local population.

139. **Allocate more time and resources for site selection procedures.** Good practice in integrating Strategic EA at early stages and EIA at later stages throughout the site selection process for landfills or other waste management facilities has been developed and is practiced today in Ireland following many years of difficult lessons learned from a system that once relied heavily on the

political process. A landmark landfill site selection case in Dublin (Box 3) was a wake-up call for officials to recognize that the process of site selection must be de-politicized. As a result, Parliament removed authority for solid waste site selection decisions from local level politicians and transferred it to higher-level technical authorities. Ireland also implemented national good practice guidelines for sequencing technical studies to assess landfill site options in conjunction with SEA: conduct a robust EIA that provides an ‘alternatives analysis’ on short-listed sites with strong public involvement; and conduct a site-specific EIA with public involvement linked to the environmental permitting process. These national guidelines emphasize the importance of a technically sound iterative process that incorporates public involvement at each step. Higher up-front costs and a longer time frame ultimately pay off because the decision making process moves forward, and does not get reversed. Waste incineration schemes can be particularly challenging in this respect, as their development faces strong public opposition. Planning process and consultation procedures should be carefully designed and may take considerable time.

Dimension 2: Operationalize the national waste management plans

140. **Increase central-level implementation capacity.** Dramatic improvements required by EU targets need a strong top-down push in the form of adequate program management, planning, and incentives, but central-level capacity is insufficient to operationalize national strategies. Central ministries require enough staff to operate effectively, with realistic plans, measurable targets, and intermediate deadlines. However, building central-level capacity does not mean a return to old-style central planning. For example, in Bulgaria, during the first phase of implementing the national waste management plan, fund absorption was slow, so during the second phase, Government opted to allocate funds for regional sanitary landfills at the national level and the Ministry of Environment even participated in landfill site selection. While this may assist municipalities during the preparation phase, lack of local ownership will likely delay implementation and may cause future issues with the local population, whose support will be needed when landfills begin to accept larger waste volumes from other regions.

141. **Strengthen inter-municipal entities for regional waste management.** Integrated solid waste management depends on effective regional-level implementation and coordination. International experience demonstrates that strong inter-municipal entities are crucial for regional planning and service administration. They require a solid institutional, technical, and financial operational base, and often operate through a regional public company that has sufficient autonomy and resources, supervised by the founding municipalities. Assistance is needed to establish strong, negotiated inter-municipal agreements as the ‘institutional backbone’ of regional integrated solid waste management systems. These agreements need to specify responsibilities, distribute risks, and share benefits among signing parties.

Box 3: The use of EU structural funds in Dublin

Ireland used EU funding to implement the EU waste policy. Countries such as Romania, Bulgaria or Poland planned to use of European Regional Development Funds to essentially subsidize investments in compliant disposal facilities at up to 97 percent. However, these countries are struggling to build a project pipeline, and to finalize sites for inter-municipal facilities. Ireland exemplifies a radically different approach: Dublin used PPP to finance a new incinerator that allowed for capacity optimization, and for project preparation, including extensive public consultations and communications, they used a massive EUR8.0 million ERDF grant; funding that might have been difficult to secure from budgetary sources.

142. **Provide support for project preparation.** One of the major challenges of using available investment funding and implementing existing policy is the lack of assistance for project preparation—both financially, technically, and organizationally. Administrative units at the local and inter-municipal level are in charge of day to day work to make integrated solid waste management systems functioning in practice. They apply for funds based on project proposals they develop and submit for approval to the authority administering the funds.

143. However they lack the capacity and resources to put forward such project proposals, come up with feasibility studies and technical designs, prepare bidding documents, and contract for goods, works, and services. Earlier EU newcomers, such as Ireland, have used available grant funding to heavily support project preparation; and successfully mobilized private capital for project implementation later on (see Box 3). Grant and technical assistance programs need to put more emphasis on this up-front bottle-neck.

Dimension 3: Progress towards medium-term economic and financial sustainability

144. **Increase the share and improve the conditions of private participation in service provision.** Participation of private providers in waste management services can benefit the system as a whole. Public budgets are spared necessary investments in SWM systems, private enterprises can bring innovations and good management expertise into play, they decrease the possibility of patronage politics, and they make the provider directly accountable to the clients—especially in situations in which the government offers no subsidies for service provision. Well written contracts with adequate risk apportionment that are tendered through transparent mechanisms, can also greatly contribute to improving the cost-efficiency of the system as a whole.

145. **Where possible, link service level improvements to tariffs increase.** Governments often subsidize service provision through low tariffs to ensure access to affordable services for low income groups. However, by doing so, they can make waste management unattractive to private enterprises that do not want to be at the whim of the public sector; and providers often end up being accountable to policy makers rather than to their clients. Since politicians often keep waste management fees below recovery costs for short-term political gain, they can make service providers dependent on central government grants and/or on un-penalized service cutbacks. At the same time, it becomes even more difficult to adjust tariffs at a later stage when they cannot be justified with improvements in the quality of the service. Further sources of additional revenues or cost reductions can also be sought by improving the recycling levels. Although all four countries have a vibrant recycling sector, stronger public education and outreach is required to reach targets.

146. **Seek additional revenue sources or cost reductions by improving recycling levels.** Bulgaria, Croatia, Poland, and Romania have a private recycling sector, but stronger public education and outreach is required to reach targets.

147. **Define clear affordability limits.** In many countries, lower income groups bear a disproportionate share of inefficient services, and they tend to pay higher prices than more affluent households. Since they often do not benefit from economies of scale and network externalities (e.g. in rural areas), and are often taken advantage of by individual providers (especially when one provider has the service monopoly in the area), they not only have to spend a higher share of their budget on services, but they also tend to receive poorer services. Central or regional governments can help poor jurisdictions to solve this problem by bringing them together, and helping them form a common front for negotiating with individual providers.

B. Conclusion and the way forward

148. Bulgaria, Croatia, Poland and Romania have had access to large amounts of EU grant assistance and support from European Financial Institutions, which for the most part remain unspent. Despite generous financial assistance to adopt national waste strategies, the current set-up of international assistance seems to fall short tackling essential systemic issues. None of the three new EU members is on the path to using all solid waste management ERDF funds by the target date. Currently available funding sources have not been used or assigned to optimize sector performance, but, with few exceptions, finance projects or project preparation. Yet the last ten years have demonstrated that a project-by-project approach is inadequate for new members to achieve sufficient scale to come within reach of the moving target of EU waste policy.

149. Findings of this cross-country analysis and consultations with the European Commission suggest a need to scale up support to improve solid waste management performance in some new EU member or candidate countries. Table 7 below gives an overview of the major shortcomings identified in Bulgaria, Croatia, Poland, and Romania; the gap of funding, and other assistance required to address these challenges but currently not available. While form and modalities of involvement would vary based on differing needs country by country, World Bank experience in the ECA Region and elsewhere suggest possible ways for support (see Box 4).

150. Solid waste management performance improvements would need a more systemic sector approaches compared to those of the past. Sector interventions in individual countries would require tailored solutions that match issues as identified in this report, but also balance specific implementation capacity. EU member countries soon will need to initiate elaboration of Operational Programs for the new structural funds funding period (2014-2020). The results of this process will define if available EU grant resources will be used wisely and in an economic and financially sustainable way.

151. Findings of this report could be most timely to support this process. They can provide inputs for a targeted dialogue with national and sub-national policy-makers and senior officials charged with Operational Program implementation and development of the new programming period to be initiated soon. Such a dialogue would initially seek feedback on findings and recommendations of the analysis, but also give the opportunity to learn from sector practices in more advanced EU member countries, and eventually, lead to prioritizing targeted initiatives in new EU member and candidate countries.

Box 4: The World Bank and Solid Waste Management

In 2008 figures, the World Bank supports solid waste management development in 72 projects worldwide. This number includes projects fully focused on this sector as well as projects (or programs) that have a partial development objective in solid waste management. Total value of investments and sector development activities was US\$613 million. In the Europe and Central Asia (ECA) region sector involvement totaled solid waste activities in 16 projects with a total value of US\$173 million.

These projects finance a wide range of activities, both investments and technical support programs. Typical examples of activities in the field of solid waste management that regularly occur in Bank-funded projects and in which multi-country expertise has been gained are:

- Development and strengthening of institutional arrangements
- Legal framework preparation and policy reform
- Private sector involvement
- Cost recovery, tariff reform and financial sustainability
- Inter-municipal arrangements for waste collection and regional disposal facilities
- Collection and waste recycling systems
- Transfer, landfill, composting and dump closure
- Upgrading of waste pickers' livelihood
- Economic instruments and inter-governmental transfers

These activities are undertaken and financed in a broad variety of project concepts. Common are projects fully designed for improvements in the solid waste management sector. In the ECA region, a number of projects concern investment programs for regional waste disposal facilities. An example of a more integrated approach is the Bank's recent solid waste management project in Azerbaijan. For the area around the capital city (Greater Baku), this project implements a substantial technical assistance program for sector reform in combination with investments in roll-out of collection services; upgrade disposal facilities; closure of unregulated dump sites and development of new investments in waste transfer and more advanced approaches to waste minimization and disposal. The technical assistance program guides the reform of the sector, supports the operationalization of a new metropolitan institution for solid waste management and develops financially sustainable tariff structures and operational models with data and billing systems.

In other projects, solid waste management is rather a component of a broader project or program. For instance, in Turkey, solid waste management investments are part of a program for investments in municipal services managed by a municipal investment bank where local authorities can apply for funding in sanitation, local infrastructure and solid waste management projects. In other countries, partial solid waste management investments are related to urban development programs or climate change mitigation programs (landfill gas recovery and the use of bio-fuels for energy generation).

Typical financing instruments in Bank funding are investment lending and technical assistance lending. A more elaborated overview of instruments is given in Annex 7.

In addition to lending from own resources, in the solid waste management sector, the Bank also facilitates in co-funding instruments such as carbon finance arrangements and grant support from the Global Environment Fund (GEF, e.g. in PCB management projects).

Table 7: Major shortcomings and possible areas of intervention

Country	Sector challenges	Investment needs	Technical Assistance needs
Romania	Weak local project preparation and implementation capacity Overlapping responsibilities at county (regional) level Limited central level supervision and project management capacity Underdeveloped recycling and composting market	EUR870 million overall funding gap EUR230 million co-financing needs	Local and regional management Central level project management PPP advice Recyclables Market Development
Bulgaria	Deficient landfill site selections Weak regional associations and lack of local ownership Very low enforcement capacity Long-term financial sustainability Limited data availability	EUR55 million co-financing needs	Sector optimization Financial sustainability Enforcement Landfill site selection
Poland	Persistent lack of data Fragmented institutional framework and weak enforcement capacity Waste ownership and local incentive structure Very slow project preparation and weak local capacity Weak public consultation and strong local opposition High share of illegal dumping	EUR550 million funding gap	Landfill site selection Public consultation Regional strategy and planning
Croatia	Weak landfill site selection procedures and strong local opposition Lack of regional project management capacity Island waste collection during tourist season Lack of PPP experience	EUR350 million overall funding needs	PPP advice Landfill site selection Regional management

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Annex 1: List of representatives and institutions met

Institution	Name and Title
<i>Bulgaria (June 2009)</i>	
Ministry of Environment and Water	Emilia Stoyanova Executive Director, Enterprise for Management of Environmental Protection Activities Maria Krusteva-Ninova Head of Department, Waste Management Directorate Shteryo Nozharov Director, Climate Change, Investment Policy and PP Department
National Association of Municipalities	Ginka Tchavdarova Executive Director
Bulgarian Association of Recycling	Temenuzhka Kostova Executive Director
ECOPACK	Kiril Zdravkov Executive Director Tihomir Lazarov Technical Director Monika Romenska Manager Regulations, Municipal and Public Affairs
Ekobulpack	Vidio Videv Executive Director Milen Dimitrov Procurist
Municipality of Gorna Malina	Emil Naidenov Mayor
For the Earth Environmental Association	Anton Tzanev
Borrowed Nature Foundation	Stoyan Yotov Executive Director
Environmental Association "Za Zemiata"	Venelina Velichkova
<i>Croatia (December 2008 and February 2009)</i>	
Ministry of Environment Protection, Physical Planning and Construction	Nikola Ruzinski State Secretary Vlatka Lucijanic Justic Head of Department for EU Infrastructure Development Programs Mladen Glavocevic Department for EU Infrastructure Development Programs
Environmental Protection and Energy Efficiency Fund	Vinko Mladineo Director Sandra Prskalo Head of Director's Office

Ministry of Economy	Drazen Ivanusec Head of Department for the Public Procurement System Teja Kolar Department for the Public Procurement System Maja Kust Department for the Public Procurement System
Central Office for Development, Strategy and Coordination of EU Funds	Hrvoje Dolenc State Secretary Damir Tomasovic Head of Department, EU Programs, Economic and Social Cohesion
Government Agency for Public-Private Partnership	Kamilo Vrana Director Mario Turkovic Senior Advisor
Gumilpex	Damir Kiric Director Patrick Stadaas Chief Accountant
CISTOCA, Zagreb Holding	Marko Melcic Director Dinko Sincic Assistant Director
Delegation of the European Commission	Davor Percan Task Manager, Environment and Energy Zeljka Zgaga Task Manager, Infrastructure and Competitiveness
Public Institution for Management of Municipal and Non-hazardous Waste in Northwest Croatia (JUSZH)	Nedo Cepic Director
Zagrebačka County	Ljerka Rajaković
Varaždinska County	Nevenka Krklec, Ivana Dukši
Sisačko – M`oslavačka County	Ante Rajić
Vukovarsko -Srijemska County	Tamara Šarić, Mario Naglić
Krapinsko -Zagorska County	Stjepan Bručić
Međimurska County	Mr. Baranašić, Sandra Golubić
Koprivničko – Križevačka County	Darko Koren, Marijan Štimac, Zlatko Filipović
Virovitičko-Podravka County	Iva Šarić Srzić, Dubravka Repić
Bjelovarsko - Bilogorska County	Ivo Vatrov
City of Zabok	Željko Tomek
City of Varaždin	Antun Mišanović
City of Prelog	Željko Poredoš, Siniša Radiković

City of Zagreb	Goran Šarić
City of Ludbreg	Darko Crnković
City of Đurđevac	Tomislav Sardelic, Mario Mahovlic
City of Krapina	Marko Ljubić
City of Oroslavje	Ivan Tuđa
<i>Poland (December 2008)</i>	
Ministry of Environment	Aleksandra Malarz Director, Department for Operational Program Infrastructure and Environment
National Fund for Environmental Protection and Water Management	Malgorzata Skucha Deputy President and Responsible for waste management Jerzy Swaton Director, Soil Protection Department Edyta Stankiewicz Deputy Director, Soil Protection Department
Price Waterhouse Coopers	Alina Sarnacka Manager, Transport, Infrastructure and Public Sector Department Maciej Czura Associate, Transport, Infrastructure and Public Sector Department
<i>Romania (December 2008 and February 2009)</i>	
Ministry of Environment and Sustainable Development	Nicoleta Chiriac General Director, Directorate of Soil, Subsoil, and Waste Management Liliana Chirila General Director, Managing Authority for SOP Environment, General Directorate for Management of Structural Instruments
National Environmental Protection Agency	Brandusa Petroaica Director, Waste and Chemical Dangerous Substances
Romanian Association of Solid Waste Management	Viorel Marcu Director Alexei Atudorei Advisor
ECOROM Ambalaje (Association of Recycling Industry)	Sorin Popescu General Manager Liliana Nichita Director, Department of Technical Assistance
Municipality of Piatra Neamt/ County of Neamt	Lucia Popirda Executive Director, Project Implementation Unit, City Hall Piatra Neamt
<i>European Commission (December 2008 and March 2010)</i>	
DG Regional Policy	Anastassios Bougas Head of Unit, Romania Benoit Nadler

	<p>Desk Officer, Romania</p> <p>Panayotis Thanou</p> <p>Desk Officer, Croatia (IPA/ISPA)</p> <p>Hanna Dudka</p> <p>Desk Officer</p> <p>Renaldo Mandmets</p> <p>Head of Unit, Bulgaria</p> <p>Carsten Rasmussen</p> <p>Deputy Head of Unit, Bulgaria</p> <p>Stavroula Pelekasi</p> <p>Desk Officer, Bulgaria</p> <p>Valeri Natan</p> <p>Desk Officer, Bulgaria</p> <p>Marek Teplanski</p> <p>Desk Officer, Poland</p>
DG Environment, International Relations and Enlargement	<p>Joanna Fiedler</p> <p>Policy Officer</p> <p>Francois Delcueillerie</p> <p>Desk for Croatia</p> <p>Karolina Fras</p> <p>Waste Management</p> <p>Michail Papadoyannakis</p> <p>Waste Management</p> <p>Rosalinde Van Der Vlies</p> <p>Waste Management</p>
DG Environment, Cohesion Policy and EIA	<p>George Kremlis</p> <p>Manager</p> <p>Anastatios Nychas</p> <p>Policy Officer</p> <p>Katarzyna Charzynska</p> <p>Policy Officer</p> <p>Katarzyna Kot</p> <p>Policy Officer</p> <p>Daniele-Veleria Andrei</p> <p>Policy Officer</p> <p>Milena Novakova</p> <p>Policy Officer</p>
DG Environment, Sustainable Production and Consumption	<p>Hans Christian Eberl</p> <p>Policy Officer</p>
DG Enlargement	<p>Noora Hayrinen</p> <p>Desk Officer, Croatia</p> <p>Rachele Gianfranchi</p> <p>Gordon Purvis</p> <p>Infrastructure and IFI, IFI Advisory Group</p>

Annex 2: Institutional Arrangements Overview Matrix

FUNCTION	INSTITUTION			
	BULGARIA	CROATIA	POLAND	ROMANIA
Policy making	Ministry of Environment (MoE) sets priorities and strategic direction in National Waste Management Plan (NWMP)	Ministry of Environmental Protection, Physical Planning and Construction (MEPPPC) responsible for Waste Management Strategy, and National Waste Management Plan (NWMP)	Ministry of Environment (MoE) sets national strategic direction; but regional governments (voivodship) have discretionary room and priorities may differ; Ministry of Regional Development (MRD) sets priorities for capital investment, in accordance with National Waste Management Plan (NWMP)	Ministry of Environment (MoE) responsible for Waste Management Strategy 2003-2013 and National Waste Management Plan (NWMP)
Legal framework	Municipalities legally responsible for SWM; required to establish regional waste management associations	Municipalities with legal responsibility for providing municipal SWM services; counties legally obligated to organize waste management at the regional level.	Municipalities have the legal responsibility for municipal SWM, but proprietary rights on the waste belong to waste holder who decides on contracting of collection service	Municipalities legally responsible for SWM, but obligations also for county (regional) administrative units
Regulation	MoE sets standards and issues permits; regional environmental inspectorates review permits	MEPPPC sets license, permit, and standards requirements; environmental inspectorates issue and verify permits	No information available	MoE sets environmental standards, and Ministry of Administration and Interior (MAI) regulates public administration standards. Licenses and permits issued by MAI
Supervision	Sixteen regional environmental inspectorates supervise compliance in 55 waste	Environmental inspectorate with central and decentralized offices under supervision of MEPPPC; Croatian Environment Agency	Environmental Protection Inspectorates at the national and regional level supervise waste management practices;	Independent Environmental Guard with 8 regional and 42 county commissariats affiliated to MoE; National Regulatory Authority

	management regions	(AZO) collects data and maintains national waste information system	municipalities supervise operators under supervision of Voivodships	(NRA) for Community Services and Public Utilities associated to MAI
Enforcement	Regional inspectorates are also in charge for enforcement, including closure of wild dumps	Environmental inspectorates conduct site visits to verify compliance, issue fees and fines, and initiate litigation as required	Municipalities responsible to ensure compliance of landfills, but very limited enforcement capacity and/or lack of instruments	Environmental Guard and NRA conduct field inspections and are in charge to apply sanction mechanisms
Planning	MoE drafts NWMP; regional associations with limited planning role in practice; larger cities prepare own plans	MEPPPC drafts NWMP, sets technology preferences, and approves landfill siting; County Administrative Offices responsible for physical planning documents and determine location of facilities, including landfills; Municipal Offices plan municipal facilities	MoE drafts NWMP; 16 Regional Waste Management Plans under the responsibility of Voivodships, plus local plans by municipalities; Landfill siting and rehabilitation decisions made at the regional level.	NWMP drafted by MoE; 8 Regional Waste Management Plans by Regional Environment Protection Agencies (REPAs) with weak capacity; municipal plans drafted by county councils, including siting, technology, and financing
Financing	Mix of EU and national funds for capital investments, allocated through MoE; co-financing also available from Environmental Protection Enterprise; O&M from current revenues; fees set by the municipal council	Waste management companies and their associated government bodies responsible for ensuring O&M, plus closing and re-cultivation; Environmental Protection and Energy Efficiency Fund (EPEEF) co-finances capital investments and administers available IPA funds	EU funds for capital investments managed at MRD and implemented through National Fund for Environmental Protection and Water Management (NFEPWM), plus 16 independent regional funds; MoE with coordinating role; Funds also provide interest rate subsidies financed from pollution fees	EU funds for capital investments, with co-financing from national and local budget; O&M through current revenues; closing and re-cultivation borne by owner of landfill; fees set by municipalities based on structure established at MoE; REPAs may charge in addition; Environmental Fund with limited functionality
Administration	Inter-municipal associations responsible for regional landfills, but in practice often administered by municipality hosting the site; MoE often main driver for preparatory works,	Regional Waste Management Companies established through inter- county or inter-municipal agreements are responsible for administration and project preparation, including	Inter-municipal associations in charge of contracting, including feasibility studies and technical designs; legal ownership issue of waste and overlaps between municipal and regional level	Municipalities are responsible for bidding and contracting, including project preparation, feasibility studies, and technical designs; county councils may administer regional service provision

	particularly at existing regional sites; collection and transport administered by municipalities	contracting for feasibility studies and technical designs	(voivodship) reduce incentives and blur the actual ownership of day-to-day responsibilities	
Service delivery	Landfills operated by public and private companies; public companies established at municipal level; collection and transport have higher share of private; recycling purely private	Regional Companies to deliver services; however, today still primarily municipalities; Mix of public and private operators for collection, transfer, sorting, recycling, and treatment	Private operators recycle and collect on economically viable routes, while public municipal utilities serve the non-cost recovering share; most landfills managed by municipal utilities, some regional	Public or private operators contracted by municipalities, county councils, or inter-municipal association; small rural municipalities depend on public utilities from nearby urban centers
Monitoring	Operators report to municipalities and environmental inspectorates; limited complaint or public feedback mechanisms	Operators report to regional company; AZO collects data, prepares indicators, and reports on waste management	Lack of reliable data one of the key issues in the sector; reporting from lower levels of government erratic; limited follow-up from higher levels	Data collection by landfill operators, processed and stored by National Statistics Institute (NSI), and maintained by MoE; analysis by Romanian Association of SWM
Public communication	Recycling companies in contracting municipalities; MoE at national level	Regional company at the local level; MEPPPC through Environment Agency at the national level; support for local level from EPEEF; public access to information through AZO	MoE and NFEPWM conduct environmental public awareness campaigns	MoE in collaboration with MAI, local administrations, professional associations, and NGOs elaborate communication and education plans at all levels

Annex 3: Slovakia – A Best Practice Case Study

Among the countries in Central and East European, Slovakia is often touted as a best practice case for its advances in the solid waste management (SWM) field. Changes in legislation and economic policy have been promoted immediately after the fall of the Iron Curtain, and the transition to sustainable SWM practices were almost completed by the time Slovakia joined the European Union. Even more laudable is the fact that policies were crafted by local stakeholders, without budgetary support and subsidies. Slovakian policy makers primarily relied on economic incentives - as a means of spurring private investment in the waste industry and as a means of motivating localities to improve their waste management practices.

Background

In the early 1990s Slovakia had over 5,000 local landfills and unregulated dumps (many being very small in size)¹⁵, which it wanted to replace with fewer, modern regional landfills. To achieve that goal appropriate legislation was passed and two major directions of action were pursued:

- an active process of dump closure through a series of administrative decrees
- the encouragement of landfill upgrading and development of new EU compliant ones.

Virtually all dump sites and many of the small landfills were closed by 1992 (90% of the pre-existent number)¹⁶. The other landfills were allowed to operate with temporary permits, and they were either upgraded or closed in subsequent years (see table below). In 1991, when the process started, only two landfills conformed to EU standards.¹⁷

Slovakia Landfills								
Year	1994	1995	1996	1997	1998	1999	7.31.2000	8.1.2000
Landfills under special conditions	408	436	424	416	429	362	159	0
Landfills meeting legislative conditions	31	102	114	124	139	141	141	141
Number of operated landfills	617	538	538	540	568	503	300	141
Operated not assessed	178							

Source: State of Environment Report of the Slovak Republik 1994-2000 (available at: enviroportal.sk/pdf/spravy_zp/svk00e.pdf)

Policy Measures

One of the most interesting policies introduced by the Ministry of Environment was *The Act of Fees for Landfilling*. The motivation of the policy and its implementation were fairly simple and ingenious: sharply differentiated landfilling fees were introduced, as a way of encouraging municipalities to upgrade or build new landfill operations. Thus, landfills that met the newly imposed technical/environmental standards had to pay much smaller fees than those that did not (see table below). Localities where compliant landfills were operated benefited most from this differentiated fee system - collected fees directly fueled their budgets. In addition, this measure encouraged municipalities to accept landfills on their territory, by allowing them to also charge operation and return on investment fees.

¹⁵ Tothova, Slavka, Milan Lalkovic, and Milan Oravec. 2007. *Afforestation of old landfill sites* (available at: <http://www.sufalnet.net/get.php?f.643>)

¹⁶ Case Study on Waste Management – Slovakia (available at: <http://www.misp-serbia.rs/en/reports.php>).

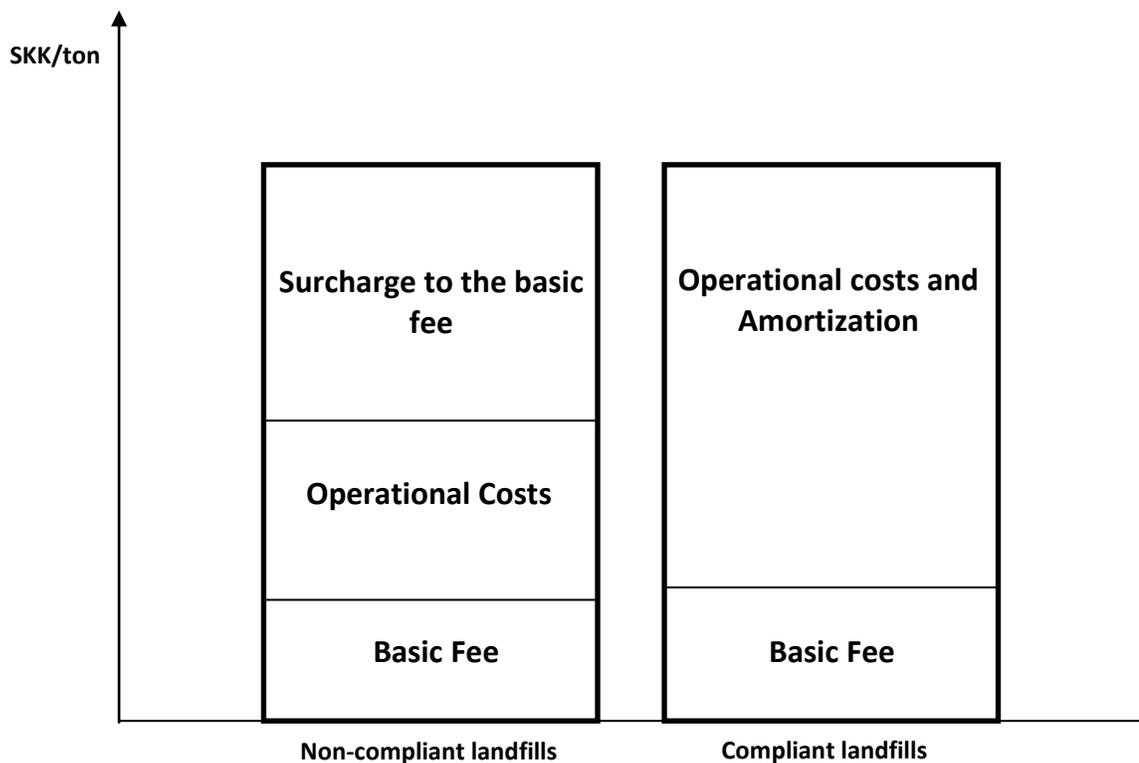
¹⁷ Ibid.

Slovakia - Landfill Fees (SKK/ton in 1991)

Type of Waste	Compliant Landfills	Non-compliant landfills
Waste soil	1	3
Other waste category	10	100
Municipal solid waste (MSW)	20	300
Hazardous waste (HW)	250	3500
Special waste (except MSW and HW)	40	480

Source: Case Study on Waste Management – Slovakia (available at: <http://www.misp-serbia.rs/en/reports.php>).

Non-compliant landfills (with temporary licenses) had to pay a surcharge (in addition to the basic fee), which was collected by the operator. The State Environmental Fund was the main beneficiary of this surcharge, and it used the generated income for environmental projects.



The surcharge aimed to eliminate the cost advantages that non-compliant landfills had over compliant ones (see figure below), and it offered municipalities incentives to use the latter. Thus, even for municipalities that operated non-compliant landfills, there was an economic incentive to transport their waste to regional landfills that met new technological and environmental standards.

In many cases, the operators of landfills are the municipalities themselves, in which case the basic fee charged for a compliant landfill just gets transferred from one municipal unit to the other. However, the surcharge that is imposed on non-compliant landfill represents an extra expense for

municipalities, and acted as an incentive to upgrade/close existing landfills and involve the private sector in the process.

Outcomes

By 2002, there were 156 compliant landfills, which boasted a high degree of technological and organizational sophistication. As outlined in the table below, the private sector was an active partner in establishing environmentally sustainable waste management systems. Half of operating landfills were owned by localities, while the other half were privately owned or were joint ventures.

Ownership	Number of Landfills
Joint venture between municipalities and foreign investors	20
Joint venture between municipalities and local investors	8
Private company (local and foreign)	30
Wholly municipally owned companies, or municipal departments	76
Dedicated landfills of industrial companies mainly for their own use	22
TOTAL	156

Source: Case Study on Waste Management – Slovakia (available at: <http://www.misp-serbia.rs/en/reports.php>).

Today, the SWM system in Slovakia is not only very dynamic, but also shows signs of maturity – with landfills being bought and sold and with operators being changed according to efficiency principles. The number of functioning landfills was still relatively high for the size of the country (165 in 2005¹⁸), but several of them were slated for closure – with regional landfills consolidating the market, and with the private sector or PPPs playing an increasing role in the sector. By 2008, around 50 landfills were to be closed – most of these were municipal landfills that were compliant, but handled very small amounts of waste¹⁹. As can be seen in the table below, 65 landfills received less than 10,000 tons of waste yearly.

Amount of landfilled wastes (tons/year)	Less than 10,000	10,000-50,000	50,000-100,000	100,000-200,000
Number of landfills with municipal waste	65	48	4	4

Source: Okolicanyiova, Milena. 2007. Decrease in the Number of Operated Landfills and Upgrading of their Technical Level in Years 1991-2009 (available at: http://www.bipro.de/waste-events/doc/events07/sk_presentation_7cohem_mo.pdf).

Future Targets

Apart from the consolidation of a regional landfill network, Slovakia is subject to Directive 2000/76/EC of the European Parliament and has to either close its waste incinerators (45 in 2005), or bring them into compliance. In addition, ambitious recycling and recovery targets have been set for the year 2010 (see table below).

¹⁸ EIONET - http://scp.eionet.europa.eu/facts/factsheets_waste/Slovakia

¹⁹ Okolicanyiova, Milena. 2007. Decrease in the Number of Operated Landfills and Upgrading of their Technical Level in Years 1991-2009

SWM Targets for 2010

	Hazardous wastes	Non-hazardous wastes
Material recovery	40%	70%
Energy recovery	25%	10%
Incineration	0%	0%
Landfills	34%	19%
Other methods	1%	1%

Source: EIONET -
http://scp.eionet.europa.eu/facts/factsheets_waste/Slovakia

Furthermore to ensure the sustainability of the solid waste network, landfilling fees were increased and revenues were earmarked for use by the municipalities where landfills are situated (see table below). The extra budget revenues are to be used solely for waste management purposes, thus creating an incentive for sustained best practices in the SWM sector.

Practiced landfilling rates (Euro)

Type of Waste	2004	2008
Hazardous	6.6	26.3
not separated	0.79	7.89
1 component separated	0.71	7.1
Municipal		
2 components separated	0.63	6.32
3 components separated	0.55	5.53
4 components separated	0.47	4.74
5 components separated	0.39	3.95
Other	0.52	5.26

Source: EIONET -
http://scp.eionet.europa.eu/facts/factsheets_waste/Slovakia

Lessons for Other Countries

While the Slovakian solid waste sector, and the way it developed, is in many ways idiosyncratic, it offers many lessons to new EU Member States, and prospective countries (like Croatia). The waste network is almost completely independent from EU funding, it has large private sector participation, and it encourages forward and sustainable thinking in the public sector.

Annex 4: Combining PPPs and EU financing for SWM projects

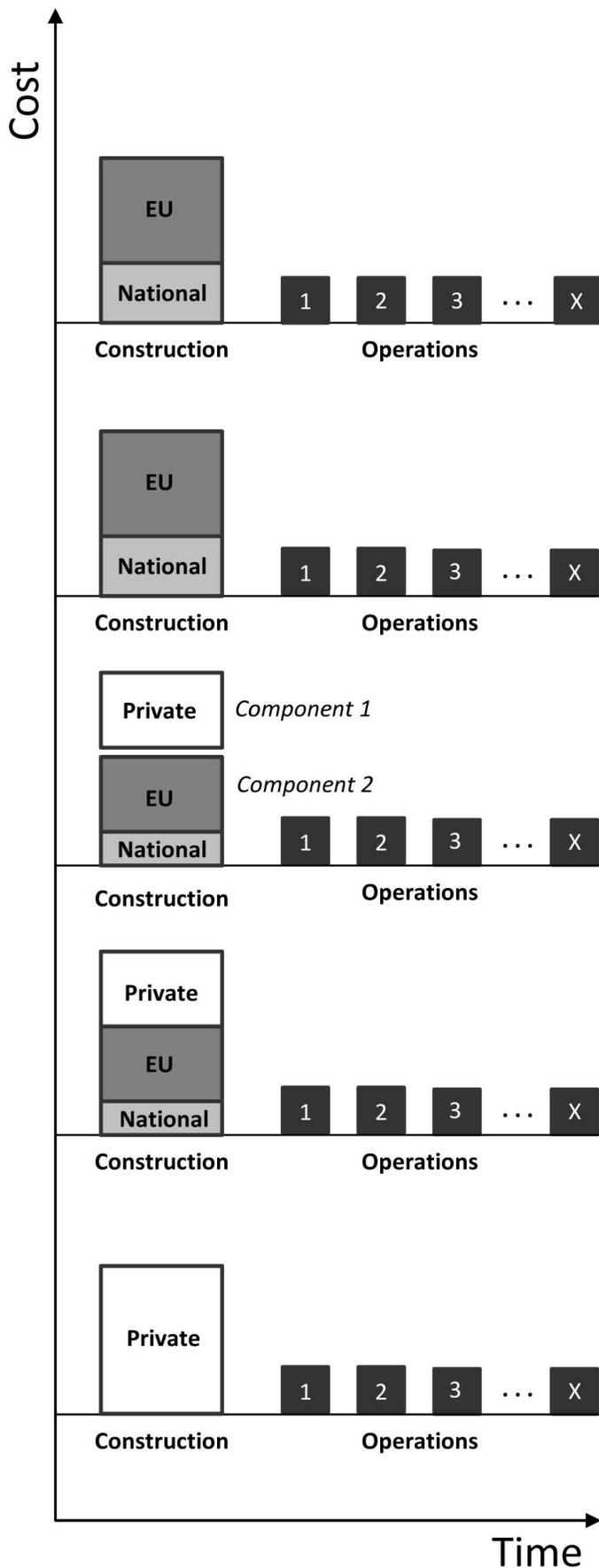
The European Commission (EC) defines a public-private partnership (PPP) as “a contractual agreement between the public and the private sector whereby the private sector provides a service traditionally delivered by the public sector”. PPPs vary greatly in complexity, ranging from simple contractual relationships between public and private entities to *institutionalized PPPs* (EC), in which the two sides cooperate closely on all the important stages of the project. EU regulations (especially EC Article 87 on competition) limit the scope of PPPs by prohibiting public financial and fiscal incentives to private entities.

PPPs for solid waste management (SWM) projects in the EU and EU-pre-accession contexts can thus be classified into three archetypes:

- **O**: Operations (and maintenance) contract
- **DBO**: Design-Build-Operate contract
- **DBFO**: Design-Build-Operate-Finance contract

EU funding is done through the IPA programme for pre-accession countries, and through Regional Development and Cohesion funds for New Member Countries. These grants are input based and typically cover initial investments and construction. Financial participation is required from the central and local governments receiving EU funding – usually, between 15% and 25% of final project costs. Furthermore, beneficiaries have to ensure the maintenance and operation of new projects. Co-opting the private sector in EU-financed project thus becomes both a necessity and an opportunity – central and local governments often don’t have the resources, expertise, and long-term vision to ensure profitability of new developments.

As any partnership, PPPs come with inherent challenges - the public side is interested in increasing socio-economic benefits while the private side looks to increase profitability. Also, EU grants usually finance initial investments and have to be fully disbursed within a short time frame, while PPP models payment covers services delivered in the operation phase. The challenge thus becomes to combine payment for inputs (investment) with payment for services. See box on next page for examples.



Operations and Maintenance PPP

It is the simplest PPP model, requiring no private financing for construction. Two separated contracts are drafted – one for the construction phase, and one for operations and maintenance. While some interface problems might arise between the contractor and the operator, this PPP-grant combining scheme is for the most part unproblematic

Design-Build-Operate PPP

Similar to the previous model, this design requires no private financing for construction, but a single contract is drafted – for construction, operations and maintenance. This eliminates interface problems and enables a life cycle approach to design. The use of EU grants is limited to investments only, but overall this model is unproblematic.

DBFO with Parallel Co-finance of Investments

This arrangement requires the drafting of two contracts: one for the design-build component, and one for the DBFO component (including operation of Component 1). Having two separate contracts makes the EU grant application easy, but interface problems may arise between the two components. Furthermore, DBFO tenders is not easy to structure, and budget risks may arise.

DBFO with Joint Finance of Investments

A single contract is drafted: design-build-part private finance-operate. Grant application is more difficult as it includes private investment expenditures. With public co-finance, sufficient risk needs to be transferred to private sector.

DBFO and 'Full' PPP

A single contract is drafted: design-build-full private finance-operate. Since there is no public sector participation, grants cannot be offered under current EU regulations. The lack of public investment means there is a high risk transfer to the private sector.

Private Sector Involvement in Recycling Industry in Southern Europe

The International Finance Corporation (IFC) considers that recycling is an overwhelmingly private driven activity that can promote job growth, higher tax revenues, environmentally sustainable practices, cleaner and healthier localities, and stronger communities. In EU Member States, the recycling sector sustains 500,000 full-time jobs, and every ton of plastic is considered to save 3,000 liters of oil (IFC. 2008. *Model for Global Development of Recycling Linkages (Assessment of IFC Advisory: Recycling Linkages Program Southern Europe and Creation of Replicative Project Model)*).

Starting in January 2006, and with the support of the Austrian Government, the IFC has been managing the implementation of a Recycling Linkages Program in Southern Europe, acknowledging the strategic importance of this sector to the economies of the region. They found that despite the infancy of recycling in the area, private enterprises complement the public sector well. Furthermore, these enterprises can be very profitable if value chains and markets are recognized and nurtured, if supportive policies are implemented, and if communities and local governments are actively engaged in the process. Ultimately, the start-up of the recycling industry needs to be encouraged by regulating away from the landfill (e.g. raising tariffs in tandem with raising service, as an incentive to recycle), and by efficient and constant communication with waste producers.

Taking advantage of market opportunities, recycling businesses in Southern Europe are starting to proliferate and flourish – whether it is new start-ups that tap into newly created markets, or existing companies that expand into this field. Thus, successful paper and car battery recycling businesses have been created in Albania, Macedonia and Serbia. Bosnia and Herzegovina boasts a textile recycling factory, which has created its own local market and collection network and uses recycled textiles to expand its mattress production capacity. A plastic recycling company in Serbia has introduced process innovations to allow for more efficient collection of plastic bottles, and in 2006 it processed almost a third (4,500 tons) of all the plastic collected in the country. Another Serbian company took on the recycling of electric and electronic waste (WEEE), closely cooperating with the local scientific research institute and suppliers of electric and electronic waste.

Annex 5: Carbon Finance mechanisms for solid waste management

Municipal solid waste contains considerable share of organic materials. When dumped in a landfill, due to biological and chemical reactions these organic materials decompose and produce variety of gaseous products, primarily carbon dioxide (CO₂) and methane (CH₄). Usually, gas production begins within a year of waste placement and may continue for as long as 50 years after landfill closure.

Landfill gas significantly contributes to greenhouse gas emissions, if not captured and used. This can be done by installing landfill gas collection and flaring systems that would lead to significant decrease of emissions. Or a collection network can be installed in a landfill and some of the recovered gas used to produce electricity and/or heat. The latter option ensures a productive use of methane, providing another benefit to the country as opposed to only carbon revenue generation from the capture of landfill gas through flaring.

Project sustainability depends on the revenue stream generated from the utilization of landfill gas. The estimated revenues from electricity and/or heat generation, combined with the sale of greenhouse gas (GHG) emission reduction units using Kyoto flexible mechanisms, allows for a sustainable operation at a lower cost than traditional investments in sanitary landfills.

The following Kyoto mechanisms could be potentially used:

- **Clean Development Mechanism (CDM; Article 12 of the Kyoto Protocol (KP)) and Joint Implementation (JI; Article 6 of the KP)**. CDM allows a country with an emission-reduction or limitation commitment under the KP (Annex B Party) to implement an emission-reduction project in developing countries. JI is used for project-based trading of GHG emission reduction credits between industrialized (Annex B) countries. Landfill gas recovery and flaring projects in ECA industrialized countries can use this mechanism and receive revenue stream based on annual landfill gas emission reductions. Under JI the revenue stream however can only be secured within current crediting period, i.e., until 2012, the end of the first Kyoto commitment period. Also, transaction costs of processing JI project pays off for bigger projects (e.g., landfills servicing cities of 1 mil. people or more), and it is time-consuming and complex.
- **(Additionality is important only in JI and CDM- Project based so entity receives benefits (\$ to company); government give overarching agreement with buyer)**
- **International Emissions Trading (IET; Article 17 of the Kyoto Protocol)** relies on the trading of the units of national emission "quotas", called assigned amount units (AAUs) between the eligible industrialized (Annex B) countries. Many parties to the Kyoto Protocol have expressed concerns that the IET could undermine the environmental integrity of the Kyoto Protocol if AAU transfers are not associated with actual emission reductions. Therefore Buyers and Sellers of AAUs use **Green Investment Scheme (GIS)** - a transparent and credible mechanism that uses revenue from AAU trade to support domestic emission reduction or other environmental measures. KP does not prescribe any rules for GIS. Therefore Buyers and Sellers can bilaterally agree on the types of activities (programs) to be financed from GIS, 'greening' criteria, and program implementation period that can span beyond end 2012. This mechanism would allow invest in smaller landfills. Transactions costs would be lower and processing less complex compared to CDM/JI as no prior emission reduction verification

is required. A number of GIS transactions have been recently concluded and more are currently being negotiated. Landfill projects could be included as one of the GIS financing window. (These projects do not need to prove additionality but may be able to do this retroactively because of Bank safeguards etc.);

- **(Purchase agreement between 2 government so buyer or WB Carbon Fund will make sure that arrangements are in place to go to correct projects through an intermediary- e.g. Environment Fund)**

Another option that might be potentially suitable for e.g. regional landfill project would be the newly established **Carbon Partnership Facility (CPF)** which is administered by the ENVCF but details on the country eligibility and minimum size of the projects are yet to be found out. The CPF will support development of programmatic and sector-based approaches to carbon finance. CDM and JI have been successful project-based mechanisms, but they are not designed to enable the broad shifts in industrial, urban and transport infrastructures or the long-term investments needed to lower carbon emission trajectories in these countries. The CPF will support investments and programs that have a potential long-term and large-scale impact on emission reductions. To do this, the CPF intends to enter into purchase agreements initially up to 2022 and potentially well beyond.

Methodologies: Carbon Avoidance (e.g. Incineration) or Carbon Capture (e.g. Methane Gas Capture)

Annex 6: Review of Environmental Funds in CEE Countries

Country	Name of Fund	Year of establishment	Sources of income	Budget	Fund still in operation?	Funds manages Structural Funds?
Bulgaria	National Environmental Protection Fund	1995, since 1997 within structures of MoE. Closed in 2002.	<ul style="list-style-type: none"> • 60 percent from the pollution above the norms fees • 70 percent from the penalties • the fees for services of MoEW • state budget target funds • donations • privatization • fuel taxes • other 	Earmarked budget within the state budget.	No	Not relevant (Bulgaria is not eligible for SF yet)
	Enterprise for Environment Protection Activities Management (EEPAM)	2003	<ul style="list-style-type: none"> • fees • state budget target funds • interests from deposits • donations • penalties and sanctions for environmental law breaks • incomes from activities of the enterprise • other 	Earmarked budget within the state budget.	Yes	Not relevant (Bulgaria is not eligible for SF yet)
	The National Trust EcoFund (NTEF)	1995	<ul style="list-style-type: none"> • "Debt-for-Environment" Swap Agreement between the Governments of Switzerland and Bulgaria 	A separate budget from national budget	Yes	No
Czech Republic	State Environmental Fund	1991	<ul style="list-style-type: none"> • Payment for the discharge of waste water into surface waters • Fees for the discharge of harmful substances into the atmosphere • Fees pursuant to the law on Waste disposal • Fees pursuant to the law on Wrapping materials disposal • Levies for the permanent or temporary non-agricultural use of soil • Fees for the production and import of substances that are harmful to the Earth's ozone layer, penalties imposed by MoE and CEI • Payment of loans 	Extra budgetary	Yes	Partially, Manages Operational program Infrastructure, Operational program Environment and Cohesion fund.
Estonia	Environmental	2000	<ul style="list-style-type: none"> • the assets transferred to the EIC upon establishment; 	EIC is as a	yes	Yes

Country	Name of Fund	Year of establishment	Sources of income	Budget	Fund still in operation?	Funds manages Structural Funds?
	Investments Centre (a legal successor of the Estonian Environmental Fund which was dissolved in June 1999)		<ul style="list-style-type: none"> • annual transfers from the state budget; • allocations from rural municipalities and cities budgets; • loans (contracted by the Government); • international organizations; • grants; • repayment of loans and related interest receipts; • pollution charges and fines; • water abstraction fees; • mineral extraction charges; • package excise, etc 	separate budget line under the budget of Ministry of Finance		implementing agency for the European Regional Development Fund's environmental measure and Cohesion Fund
Hungary	Environmental Fund	2000	<ul style="list-style-type: none"> • Environmental Fees • Environmental Fines 	Off the national budget	No , closed in 2005 and integrated into the civil society support system	No
Latvia	Latvian Environmental Protection Fund (LEPF), transformed in to LEPF Administration in 2004	1996 structural changes, new entity in 2004	<ul style="list-style-type: none"> • natural resource tax (by 2004) 	After 2004 a special budget line in National budget	Yes	No
	Latvian Environmental Investment Fund, State Capital Company	1997 (re-registered in 2004)	<p>Contractual agreements on earmarked loan schemes for any applicant, mostly municipalities (see details in report???)</p> <p>Donors include:</p> <ul style="list-style-type: none"> • Nordic Environmental Finance Corporation (NEFCO) • EU Phare contact unit (the Ministry of Finance) • Danish Environmental Protection Agency (DEPA) • United Nations Development Program • German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety 	Extra budgetary sources: international investors, EU	Yes	No

Country	Name of Fund	Year of establishment	Sources of income	Budget	Fund still in operation?	Funds manages Structural Funds?
Lithuania	Lithuanian Environmental Investment Fund (LEIF)	1996	<ul style="list-style-type: none"> • ERDF • Initially, it was supported by the EC and • USA International Development Agency • Phare capital grant • Environmental Pollution Tax 	Within state budget	yes	No
Poland	National Fund for Env. Protection and Water Management	1989	<ul style="list-style-type: none"> • Environmental Fees • Environmental Fines 	Extra budgetary	yes	Yes
	EcoFund	1992 as a foundation with mechanism "debt-for-environment swap"	Foreign debts from USA, France, Switzerland, Italy, Sweden (to be expired at the end of 2003), and Norway	Extra budgetary	yes	No
Romania	National Environmental Fund (NEF)	2000	various taxes paid by polluting economic agents, allocations from state budget, donations, sponsorships, financial assistance from various natural and institutional entities or international organizations, taxes for the issuance of environment authorization as well as the repayment of principal and interest by the users of the resources of the fund.	Extra budgetary	yes	No
Slovakia	State Fund for the Environment	Cancelled in 2002, re-established in 2005 as Environmental Fund	finances; fees; subsidies; grants; and interest on loans	extra budgetary	yes	No
Slovenia	Environmental Development Fund	1993	8.5% of public companies value that were successfully privatized. Other sources are loans granted by International Bank for Reconstruction and Development (IBRD), European Investment Bank (EIB) and EU Phare program	extra budgetary	yes	No

Annex 7: World Bank instruments for support in the SWM sector

A wide range of tools have been used for World Bank involvement in municipal solid waste management: Specific Investment Loans (SIL); Technical Assistance Loans (TAL); SIL implemented through a financial intermediary (FI); sector-specific Development Policy Loans (DPL); Carbon Finance operations (CF); and Subnational Financing (SNF). The appropriate choice of instrument can only be identified through close engagement with the client countries. However, some preliminary analysis can be made.

Investment lending

The classic SIL (project-type investment, some technical assistance, implemented by a dedicated project management unit) is a straightforward, traditional tool in the municipal solid waste management sector. SILs have yielded excellent results, for example, the Bosnia and Herzegovina Solid Waste Management Project, with a strong emphasis on political risk issues; the BiH project faced the difficult issue of inter-municipal cooperation.

The use of subnational financing without sovereign guarantee (SNF), offered by the joint IBRD-IFC Subnational Finance Department, could be useful for involvement at project level, to finance the local share of investments under an EU grant. The EBRD has used this type of financing, at terms and conditions comparable to the World Bank product, in Serbia for a multi-municipality landfill. The Bank is discussing a similar project with the City of Indjija in the Vojvodine region of Serbia. An SNF is also an option for the Northwestern Facility Project in Croatia, where the Bank is engaged in technical assistance. SNFs offer higher flexibility than an IBRD SIL: typically, funds are disbursed directly to the general budget of the municipality or municipal companies, and procurement rules use the national system, avoiding difficulties linked to combining IBRD SIL rules with EU grant rules. An SNF allows the Bank to support local governments access the commercial market under reasonable conditions and progress towards financial autonomy²⁰. However, neither the SIL nor SNF, when used for one or a handful of projects, provide sufficient leverage to work on systemic sector issues.

Retail investment lending. Both IBRD investment lending and SNF can be retailed nationally through a Financial Intermediary (FI). If the client requests investment funding, this approach can include building program management capacity within the selected intermediary. The Bank has used this approach in the solid waste sector in Brazil and Turkey. Policy leverage can also be included through financial incentive mechanisms. In particular, existing environmental funds in the four countries (see country inventory and characteristics in Annex 6) could be used as financial intermediaries for IBRD or IFC funds. Most environmental funds are extra-budgetary national funds, which normally invokes caution in recommending increased size, role, or sources of funding. However, in this case, using extra-budgetary vehicles accommodate the EU 'polluter pays' principle, which reduces the controversial aspects.

Technical assistance

A Technical Assistance Loan could be a tool to develop central-level program management capacity and fund project preparation for EU grant applications. This approach was used in the Romania Municipal Services Project (which is otherwise a SIL). A component under this project finances

²⁰ The SNF are not counted against established IBRD country lending limits.

technical assistance for preparation of masterplans, feasibility studies, bidding packages, and EU grant applications for water and wastewater investments in 10 counties in Romania. This should generate around EUR1.0 billion in investments, funded by Regional Development Funds for up to 85 percent of their value, representing substantial leveraging. However, a TA would not tackle the critical lack of central level implementation capacity.

An interesting program was the design and implementation of the regional initiative for capacity building and knowledge sharing in the solid waste sector developed under the Mediterranean Environmental and Technical Assistance Program (METAP). As METAP was funded jointly by the World Bank and the European Commission and the possibility of establishing something similar may be considered. METAP promoted “thinking regionally; acting locally,” and called for a national institution to ensure coordination and daily program management; the Bank provided quality assurance; an international consortium provided expertise and technical advisory services. This regional initiative promoted municipal solid waste management as an economic agenda, created buy-in for the agenda at the highest level, and the legacy of a sustained regional expertise network. METAP included extensive national policy work, helped draft model laws and regulations, and ultimately, shaped policies. For the Bank’s client point of view, METAP was fundamental in developing a strong project pipeline in the MENA solid waste sector.

Policy lending

Finally, the need to work on systemic, national-level issues, as identified in the last section of Chapter III, might best be served through a Sector Development Policy Loan (DPL), such as the one signed in Morocco in 2009 (see Box 6). In particular, the three systemic issues identified in Chapter III—namely (i) institutional set-up; (ii) medium-term economic sustainability; and (iii) operationalization of national strategies—could form the three pillars of such a sector-specific DPL. To be successful, this would however require strong commitment at governmental level and adequate upfront sector work.

SWM-specific DPL in Morocco

In 2009 the Bank signed the first DPL specific to the solid waste management sector in Morocco. It is one in a programmatic series of two single-tranche operations, and preparation of the second operation is now starting. Its objective is to improve the financial, environmental and social performance of the solid waste sector. It targets three reform areas:

- Improve the Governance of the sector
- Enhance the Sustainability of the services
- Mainstream Environmental and Social considerations

It also accompanied by several technical assistance programs funded by other donors (bilaterals and PPIAF). It also accompanied a strong reform program and a national investment plan, the “Plan National des Déchets Ménagers” (National Household Solid Waste Plan). The reasons that lead to choosing this instrument were the following:

- There was a clear demand from the Government, backed up by a sound sectoral strategic plan and a good reform framework that had clearly defined results indicators;
- For such a young sector in Morocco, unless the rules of the game are institutionalized and the Government starts to regulate efficiently the system, the root causes of problems would not be addressed, the modernization of the sector would likely be ad-hoc and financially and socially unsustainable;
- It could provide a strong confidence-building signal to the solid waste market that should help minimizing perception of risks and enhance the willingness of the donor community to support the reform program, as well as enhance private sector participation;
- It could help keep the Government on track of this reform agenda over the coming 4-5 years, particularly to catalyze sustainable partnerships between the center and local authorities.

In terms of Bank-client engagement, the benefits of the use of the DPL in Morocco can be characterized as follows:

- Benchmarking and monitoring progress jointly with the Government
- Dynamic and Continuous policy dialogue
- Prioritizing capacity-building needs and deepen the reform at regional and local levels
- Linking triggers to capacity and economy of reforms

Finally, it should be noted that the DPL preparation strongly benefitted from the sector work done under METAP, in particular since one outcome of the sector work was to create a consensus between ministries about the need for reform.