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BOSNIA AND HERZEGOVINA

Municipal Solid Waste Management Sector Review:

Review of the Extended Producer Responsibility in Bosnia and Herzegovina for Packaging and Packaging Waste and WEEE

FINAL REPORT

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Abbreviations

ADF	Advanced Disposal Fees
BAM or KM	Convertible Mark
BHAS	Agency for Statistics of Bosnia and Herzegovina
BiH	Bosnia and Herzegovina
BD	Brcko District
B&A	Batteries and Accumulators
CAIA	Cantonal Administrations for Inspection Affairs
CII	Commercial, Industrial, Institutional
DfE	Design for Environment
EPR	Extended Producer Responsibility
EU	European Union
EXPRA	Extended Producer Responsibility Alliance
FAII	Federal Administration for Inspection Issues
FBiH	Federation Bosnia and Herzegovina
FEP	Fund for Environmental Protection of FBiH (FBiH)
FMET	Federal Ministry of Environment and Tourism
FIS	Federal Institute for Statistics
Fund	Fund for Environmental Protection of FBiH or Fund for Environmental Protection and Energy Efficiency of the RS
FWMP	Federal Waste Management Plan
FWMS	Federal Waste Management Strategy
HDPE	High Density Polyethylene
LWM	Law on Waste Management (FBiH)
MBT	Mechanical Biological Treatment
MRF	Materials Recovery Facility
MSPCEE	Ministry of Spatial Planning, Civil Engineering and Ecology
OECD	Organisation for Economic Co-operation and Development
PCB	Polychlorinated Biphenyls
PE	Polyethylene
PET	Polyethylene Terephthalate
PP	Polypropylene
PR	Public Relations
PRO	Producer Responsibility Organization
PRO EUROPE	Packaging Recovery Organisation Europe
PUC	Public Utility Company
RPPW	Regulation on Packaging and Packaging Waste
RS	Republica Srpska
RWC	Recyclable Waste Collection Companies
SIDA	Swedish International Development Agency
SWM	Solid waste management
VAT	Value Added Tax
WEEE	Waste Electrical and Electronic Equipment
WFD	Waste Framework Directive
WIS	Waste Information System
WM	Waste Management
WML	Waste Management Law (RS)

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Suggestions and recommendations provided in this report are subject to the limitations inherent to availability of site-specific information, and based on authors assessment, experience and knowledge about the situations in BiH.

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Executive summary

1. **Since 2000 the municipal waste management sector in BiH is under reform** driven by the policy framework of the European Union (EU). As a potential candidate country for EU accession Bosnia and Herzegovina (BiH) has initiated harmonization of its legislation with that of the EU. Both entities (Federation of Bosnia and Herzegovina (FBiH) and Republika Srpska (RS)) and Brcko District (BD) have prepared Waste Management Strategies (WMS) and FBiH also prepared a Waste Management Plan (WMP) for implementation. The main objectives of the WMSs are related to the reduction of risks for environment and human health, reduction of waste disposed in landfills and strengthening of the legal, institutional and economic framework. FBiH and RS have partially implemented a regional disposal system with financing from the World Bank and the EU-IPA. Despite progress made in solid waste management (SWM), BiH continues to experience various difficulties such as high operational costs, lack of financing for investments, low waste collection coverage, very low waste separation, waste disposal at non-sanitary landfills, legislation not fully harmonised with EU Directives, weak institutional framework, insufficient staff capacity at all levels and low level of public awareness with respect to SWM. The Entity Governments and BD are committed to improve the current situation and enhance the performance of the sector in a more economically, financially and environmentally sustainable manner.

Current state of SWM in BiH

2. **The total amount of MSW generated in 2013 is estimated to 985,000 tonnes.** Field tests indicate a waste generation rate in urban areas of 1.05kg/cap/day and 0.55 kg/cap/day in rural areas with an overall average of 0.8kg/cap/day. Ad hoc waste sampling and composition analyses indicate an organic content of 25-50% and a dry recyclables (paper/cardboard, plastics, glass, metals) content of 33% of which about 3% is collected directly from the commercial/institutional generators and thus not disposed in the municipal containers. The lack of reliable information on waste quantities is hampering a proper planning and investment policy. BiH is a scarcely populated country (approximately 3.5 million inhabitants over 51,200km²) divided into 143 municipalities or an average size per municipality of about 25,000 inhabitants. Consequently, the generated waste quantity per average municipality is about 7,300 t/y of which approximately 70% is currently collected.
3. **The SWM legal framework is guided by the Law on Waste Management** in each entity**,** which promotes the Principles of *Waste Hierarchy*, *Polluter Pays* and *Producer Responsibility*. All three entities have prepared Waste Management Strategies up to 2018 (FBiH) and 2026 (RS and BD) promoting further harmonisation of legislation with EU Directives, regionalization of disposal, introduction of waste separation at source, and the creation of sustainable waste management systems. The obligation of preparing WMPs is not followed up by all municipalities and Cantons.
4. **The institutional architecture of the SWM sector in BiH is divided over several levels such** as the (i) State level with the Ministry of Foreign Trade and Economic Relations (MoFTER) as the overall coordinator of all activities and harmonisation of plans of the entity bodies, the government and institutions including the Agency for Statistics of BiH, the (ii) entity level (FBiH, RS) and the level of BD each having its own Parliament/Assembly and Ministries and the (iii) Cantonal level including the 10 Cantons in FBiH and (iv) the local level consisting of about 143 municipalities. The key institutional actors for planning and preparation of legislation in the field of waste management are the Ministry of Environment and Tourism FBH and the Ministry of Physical Planning, Civil Engineering and Ecology in RS. These Ministries are heavily understaffed and missing the capacity to prepare and implement the required reforms. Funds for Environmental Protection are established in FBiH and in RS. The main role of these Funds is the collection of environmental fees and penalties while recently they were assigned with the task to collect statistical information on waste generation, collection and treatment. The Statistical Institutes at entity level and the Environmental Funds in FBiH and RS are operating in parallel without proper coordination in the collection of statistical data. The entity Institutes are informing the State Agency for Statistics in view of international reporting. The main players in the SWM sector are the municipalities being responsible for its implementation and management including the setting of

the tariffs and any decision taking on regionalization, waste separation, treatment and required investments. The exception is Canton Sarajevo where communal services are organised at Cantonal level. All waste management activities are carried out by municipal companies i.e. collection, separation/sorting and landfill management. The municipal SWM companies are part of the Municipal Departments for Public Utilities, which could also be responsible for water and electricity supply, infrastructure maintenance, and other services. Only one foreign company is operating in FBiH based on public-private partnership (PPP) agreement with municipality, while in RS several local companies are providing municipal waste services. Some private companies are active mostly in the field of dry recyclables collection. In addition there are umbrella organisations representing the interests of stakeholders such as the Association of Municipalities, Bosnian Solid Waste Association (BASWA) and the Association of Communal Utilities.

5. **Collection coverage in urban areas is 90% and in rural areas average 40%.** Waste collection is mostly by the bring system using 1,100 litre containers. Some municipalities use also 120/240 litre containers for door-to-door collection and large skips (5-8m³) mainly for non-hazardous industrial waste collection. Collection frequency depends on the municipality but can vary from 1x week up to 5x week.
6. **Landfilling is still the major disposal option for municipal waste collected.** The municipal companies operate also their own landfill, which is normally a dumpsite not complying with the most essential environmental criteria such a bottom liner, gas collection and leachate treatment. Landfill operations are poor due to lack of compaction equipment, covering of the waste layers, waste acceptance procedures resulting in all kind of wastes being dumped. Municipal landfills are not provided with truck weighing scales and the waste quantity is estimated on basis of the truck volume. In addition to the official municipal landfills there are many illegal dumpsites. However, over the last decade a total of eight regional landfills were established including Sarajevo, Mostar, Zenica and Livno in FBiH, and Banja Luka, Prijedor, Bijeljina and Zvornik in RS. A total of 53 municipalities out of a total of 143 municipalities are currently disposing at regional landfills of which 28 in FBiH and 25 in RS.
7. **Waste separation and recycling is in its infancy.** Dry recyclables are separated through (i) direct purchase from the commercial/institutional/industrial (CII) sector by small private companies; (ii) using extra municipal containers followed by further sorting at a sorting line; (iii) separation of mixed waste at separation lines; (iv) waste pickers taking out recyclables from municipal containers; (v) landfill separation (e.g. in Sarajevo, Zenica. Goradze). The total separated quantity is estimated at about 5% i.e. 3% being direct purchased from the CII sector and 2% from household waste collection. The RS Waste Management Strategy stipulates a separation of 50% of packaging or 23% of the total waste in 2026 and the FBiH Strategy stipulates 35% separation or 10% of the total waste in 2017. These targets are rather ambitious taking into account the results achieved so far. There are in total in FBiH and RS 4 sorting lines for pre separated dry recyclables each with a capacity of 5t/h and 2 lines for mixed waste separation each with a capacity of 10-15 t/h. The separated saleable recyclables at the sorting lines is about 50% of the input while for the mixed waste separation lines it is between 2-3% of the input. All lines operate with financial losses due to lack of large input quantities and due to the sub-standard quality of manual sorting.
8. **Financing is the backbone of solid waste management.** The municipalities set tariffs based on various calculation methodologies such as m² usable surface, fixed amount per person per household, fixed amount per household, etc. Therefore, the tariffs are different in each municipality. The tariffs for the CII sector are calculated per m²/activity, size of container or per individual transaction. Tariffs per m² might vary between BAM 0.12-17.5/m² per month as compared to BAM 0.1/m² for households. Tariff contracting and tariff collection is the responsibility of the waste collector both for households and for the CII sector. The average tariff collection coverage is between 80-90% whereby it should be taken into account that 18% of the population is living below the national poverty norm (BAM 850/month). Tariffs have not been increased since many years. Authorities are reluctant to increase the tariffs mainly for political reasons. No reliable information is available on the actual waste management costs because (i) costs inside the Municipal Department of Communal Utilities are often not clearly allocated per activity and (ii) costs inside

the waste collection company are often not strictly separated from other services such as street cleaning, etc.

9. **Capacity building at all levels of the administrative system and among operating companies is urgently needed** to implement an efficient and effective SWM system with accountable stakeholders. Presently the responsible departments at the ministries are heavily under staffed. At municipal level the capacity in the field of MSWM needs urgent strengthening both inside the Municipality and inside the waste management companies. The municipalities have to prepare themselves on changes in their future role in view of regionalization policies and possible PPP developments. Policy development should become more important including preparation of annual WMPs, communication and public awareness (PA) campaigns, complaint handling, tariff collection, etc. At operational level the collection and disposal companies need strengthening and training of staff to become more efficient by improving accounting procedures, tariff calculations, cost control, planning, maintenance, equipment procurement, data collection and reporting, etc.
10. **The existing waste management set-up for both waste collection and disposal is inadequate in most municipalities.** Main challenges facing the current waste management system and its operations are: (i) having a significant number of residents living in rural areas without waste collection services leads inevitably to uncontrolled dumping of waste; (ii) the number of uncontrolled landfills and dumpsites is high; (iii) large number of facilities do not conform to recent technical standards and thereby pose a risk for human health and the environment; (iv) separate collection and sorting of recyclable waste is undeveloped, composting and anaerobic digestion of bio-waste is not practiced and there is no pre-treatment of residual mixed waste prior to landfill; (iv) whereas tariffs set for waste collection approach their full-cost recovery levels, those for disposal are very low and fail to provide the financial incentives needed to motivate acceptable disposal practice; (v) tariffs will need to rise considerably before the minimum standards of international good practice can be met; (vi) low levels of cost recovery from users make service providers reliant on budget transfers from municipal and central government funds; (vii) legislation is fragmented, with regulatory provisions distributed across a number of legal acts; (viii) Control over waste disposal operations is weak and mechanisms to enforce legal compliance are only poorly developed and implemented; (ix) public administrations responsible for the municipal waste sector do not have the resources needed to manage modern and increasingly complex systems; (x) current institutional arrangements do not support the involvement of the private sector and create unnecessary barriers to attracting investment; (xi) poorly developed arrangements for inter-municipal cooperation are an obstacle to the creation of modern waste treatment and disposal infrastructure; and (xii) people generally are poorly informed on all aspects of modern municipal waste management.

Extended Producer Responsibility in BiH

11. **The extended producer responsibility (EPR)** is established as principle in the legislation adopted by both entities, including: (i) requirements for the product design that stimulates prevention of waste, reuse and recovery; (ii) restrictions for the use of certain categories of materials and dangerous substances in products above certain limit values; (iii) responsibility for organizing take back and separate collection schemes and to ensure safe recovery and/or disposal of resulting waste; (iv) providing information to consumers about the important features of the product and packaging with regard to waste management. FBiH has adopted specific regulations with regard to packaging waste and WEEE. The management of packaging waste is regulated in a similar way in the RS but secondary legislation on WEEE is still missing. The systems are functioning independently from each other and the EPR schemes operating in FBiH are not active in RS and opposite. EPR is not regulated in the District of Brcko.
12. **Recycling and recovery targets**. The Regulations on packaging and packaging waste management adopted in both entities stipulate that by 2016, 35% of packaging waste placed on the market had to be recovered or recycled. Material specific recycling targets also apply for paper and cardboard, plastic, glass, metal, wood and composite packaging. Targets for take back and collection of WEEE are established in FBiH with the Regulation on WEEE management. The targets are defined as percentage of the quantity of equipment placed on the market and grow from 5% for the first year

following the establishment of EPR scheme to 25% for the fifth year of its operation. Minimum recycling and recovery targets are defined as a percentage by weight of WEEE for the different categories of equipment.

13. **System operator - Producer Responsibility Organization (PRO)**. The legislation allows the producers, importers, fillers, packers, distributors and suppliers of packed goods to transfer their obligations for the organizing the collection and recycling of resulting packaging waste to an operator of packaging waste management system based on special agreement. The PRO shall organize on behalf of obliged companies the collection, sorting and temporary storage of collected packaging waste, taking into account the population density, the quantity of household packaging waste, the arrangements for collection of commercial packaging, the distances to the final processing plants, etc. The PRO may perform these activities individually or through authorized subcontractors. The Regulations impose a requirement for non-for-profit operation of PRO and its entire profit (if any) must be invested in infrastructure for packaging waste management. It also contains specific provisions limiting the potential founders of PRO to legal entities that conduct their business activities by putting into circulation packaging or packaged products on the state territory. Service fees to be determined by the operator of the system should be equal for the founders and for the clients of the operator. The operator of the system cannot possess its own infrastructure for waste management.
14. **The System Operator needs to obtain a permit** issued by the relevant Ministry. The legislation adopted at entity level specifies the requirements and procedures for the application, issuing, withdrawal, revision, renewal and prolongation of permit. The permit duration is limited to a period of five years. The supplementary documents required for the obtaining of permit by the PRO include preliminary contracts with producers and importers of packed goods; preliminary contracts with authorized waste collectors and processors for all types of packaging materials; packaging waste management plan; statute of the system operator; other evidences. The Waste Management Plan prepared by the PRO is integral part of the application for the permit and shall contain information about: types of packaging managed, the manner and frequency of taking over the packaging waste from the end-user; the type and capacity of equipment, plant and equipment for the collection, temporary storage, sorting and other activities to ensure reuse, refurbishment and disposal of packaging waste; the total envisaged mass of packaging waste to be collected during the year and the weight of packaging materials that need to be recycled in accordance with national goals; methods and manufacturers that provide reuse, recovery and disposal of collected packaging waste; the amount envisaged processed packaging waste, and of the quantity of certain recyclable materials according to national targets. Some of the permit requirements are not well defined and allow for subjective interpretation. At present two System Operators have been given a licence by the Federal Ministry of Environment and Tourism to operate in FBiH for packaging waste and two operators obtained permits for WEEE. In RS only one operator is licensed for packaging waste.
15. The obliged companies (manufacturer, importer, packer, filler, etc.) are required to submit to the Fund **annual reports on the management of packaging waste** for the previous calendar year, as well as evidences confirming the accuracy of the data specified in the report. The report templates are provided as Annexes to the Regulations adopted at entity level and contain detailed data about the quantities and type of packaging placed on the market, imported and exported to other countries, the amount of packaging contracted to PRO, the amounts of packaging waste collected, recycled and recovered per type of material and recovery operation. In RS, a packaging specification containing information about the weight of the product and the weight of the packaging in which the product is packed, the type, weight and percentage share of the packaging material per package shall also be submitted in addition to the report. The PROs are also obliged to submit annual reports containing detailed information about the obliged companies that transferred their responsibilities to PRO, the types and quantities of packaging represented by the organization and the amounts of packaging waste recycled and recovered. The data about the packaging waste separately collected shall be reported separately for household (communal) and commercial packaging (other sources).
16. **Fees for non-achievement of recycling and recovery targets**. In case of not transferring the obligations to a licensed System Operator, the obliged importers, fillers, packers, distributors and end - suppliers are obliged to pay fees for loading the environment with packaging waste to the

respective entity Fund. These fees practically present a penalty for not achievement of general and material specific recovery and recycling targets for packaging waste. The fee is determined according to the type, quantity, composition and purpose of the packaging, the material from which the packaging was made, as well as in relation to the national goals (recycling and recovery targets). The revenues from the fees are specifically used for the management of packaging waste. The procedures for the calculation and the payment of fees are not well defined in FBiH as there is no requirement or guidance how the packaging quantities shall be measured and recorded by the obliged companies. The annual payment of the fee is difficult to be enforced compared to monthly payments, especially taking into account that no formal requirement exists the fees to be calculated in the price of goods sold. It is not clear on what basis the size of the fee coefficients for the different packaging materials were calculated and defined. The differences in maximum estimates of the fees per tonne for the different materials are not significant and do not correspond to the different separate collection costs for the different materials (i.e. cross subsidies between the different packaging materials shall be expected).

17. The **recycling industry in FBiH is not well developed** mainly due to the limited size of the market. In this situation, the recycling shall rely on the export of waste which brings additional cost and efforts. The recycling plants must have waste management permit and comply with the requirements of the environmental legislation.
18. Over the last years there was a discussion about the results and the efficiency of the established extended producer responsibility system in FBiH. From the formal point of view, the system is achieving the recycling and recovery targets set by the legislation. The achievements over the last years are mainly as a result of the optimization of the collection practices already existing prior the establishment of the EPR scheme and the demand of the recycling industry for raw materials. The separation at source and separate collection practices in BiH are not well developed at present and far beyond the objectives specified in the Waste Management Strategies adopted by two entities. Limited numbers of separate collection containers are installed in some settlements. Some municipalities have reportedly introduced drop-off stations – otherwise known as 'recycling yards' – for the collection of recyclable materials. This is still not a widespread practice and the majority of these recycling yards have been developed as pilot projects in certain areas. The situation did not change significantly in BiH with the start of EPR schemes. The system operators implemented several small-scale projects through providing separate collection containers to PUCs in more than 20 municipalities. The size of these projects is very small and the number of containers is not sufficient to effectively organize the service in the respective area. The contribution of these projects to the achievement of recycling and recovery targets is negligible. The activities of PROs are mainly focused on PR events and public awareness. The real recycling activities in BiH are organized independently from the municipal waste collection services and operate entirely on commercial basis. Private companies collect and trade with recyclable waste commodities and following some limited preparations and processing the collected waste is exported abroad or sold to recycling plants in the country. Some of companies collecting recyclable waste are specialized in paper and/or plastic collection, others are metal scrap dealers where collection of other recyclable waste is supporting activity. The collection of recyclable waste from large supermarkets and other commercial outlets is relatively well developed in the large cities.
19. **Significant quantities of paper and plastic waste are collected by individual collectors** (informal sector) directly from the municipal waste containers or picked up at the landfills and then delivered to buy-back centres. The collection is focused to materials where the revenues cover the collection and preparation costs: like metal scrap, paper and cardboard, foils, PET bottles, large items of rigid plastics.
20. There are **no reliable data about the quantity of packaging placed on the market and the amount of recyclable waste separately collected, recycled or exported**. The centralized collection of information and database management is still not in place. The estimate prepared is that in 2013, the packaging placed on the market in BiH exceeded 200,000 tonnes. There is no information about the actual distribution of different packaging materials. Detailed and comprehensive information about the quantities of separately collected and recycled waste in BiH is missing too.

21. The waste management policy documents and the respective legislation adopted at entity level do not provide clear objectives what to be achieved by the EPR schemes with regard to separate collection and recycling. The objectives for organizing separate collection services are not realistic and do not correspond to the recycling and recovery targets for packaging waste. The permits issued to the EPR organizations do not contain conditions or clear requirements about the separate collection system to be implemented. Usually these include: type of the separate collection system, minimum population coverage, minimum quantities collected, materials collected, minimum container volume installed, collection frequency, required sorting infrastructure.
22. **Recycling and recovery targets set for packaging waste are below the level prescribed in the EU** Directive on Packaging and Packaging Waste and their achievement does not present any challenge for the licensed PROs. The recyclable waste from commercial origin and the materials collected by the informal sector are sufficient for the achievement of present recycling targets. The EPR schemes channel the materials already collected and practically do not contribute for an increase of the quantities of waste recycled. In this situation, there is no formal obligation or incentive for the PROs to develop more expensive systems for separate collection of household packaging waste. The collection targets for WEEE are low too and far beyond the objectives prescribed by the EU legislation.
23. **"Free-riders"**. Significant part of the packaging placed on the market in BiH is not declared by the obliged companies and consequently they do no contribute financially to the collection system (through EPR schemes or entity Funds). This limits the resources available in the system and does not allow significant improvements in the waste management practices. In addition, the low amount of packaging declared artificially reduces the applicable recycling targets and makes them easily achievable. Presently there are no functioning enforcement mechanisms to reduce 'free riding' and impose sanctions: i) there is no formal requirement the financial contribution for the packaging waste management to be calculated in the price of goods sold (fees charged by the PRO or fees/taxes due to Fund); ii) there is no clear guidance how the packaging quantities shall be documented and reported by the obliged companies and how the documentation shall be linked to the accounting systems applied (e.g. fees to be calculated based on sales and accumulated to special account in a similar way like VAT); iii) there is no regular monitoring on the goods placed on marked, identification of obliged companies and inspections of identified companies; iv) the quantities of packaging declared by the companies to the PROs are not subject to audit.
24. One of the major problems in the existing system is the **limited involvement of municipalities** and the lack of clear rules or agreement about their role in the establishment and financing of separate collection systems for recyclable waste on their territories. These issues are left open and agreed bilaterally between the local authorities and PROs on case by case basis. The local authorities are not actively participating in the planning and implementation of the system. The waste management and in particular separate collection and recycling shall become a real priority for the cantonal and municipal administrations.
25. There are **some gaps and inconsistencies in the existing legislation with regard to permitting of PRO and their annual reporting**. The annual reports of PRO are not subject to independent audit prior submission to the authorities. The annual reports are mainly focused on the achievement of recycling targets and do not provide information about the developments in the separate collection systems, sorting and recycling infrastructure, communication and awareness campaigns, etc.
26. **There are no established legal requirements or procedures to divide the responsibilities between the several licensed PROs**.
27. The **capacity of authorities at entity, cantonal and local levels is absolutely not sufficient** to implement a proper planning and enforcement of legal requirements. The shortage of staff could be a serious barrier for the improvement of the situation in the future.
28. There is obvious **lack of public awareness** and public outreach programs to promote waste separation.
29. The management of packaging waste and WEEE shall be considered within the broader frame of municipal waste management. The improvement of separate collection and recycling of packaging

waste and WEEE will not be possible without improvements in the overall municipal waste management system.

30. All these issues will require permanent dialogue and good will from all stakeholders. The trust between the PROs and authorities must be restored and all parties shall contribute for the achievement of the agreed common objectives. Considering the complications to implement an EPR scheme functioning at national level, it is very positive that all entities declared their readiness for exchange of information, cooperation and coordination of efforts. .

Experience in implementing EPR schemes

31. Extended Producer Responsibility (EPR) is an efficient resource management tool whereby producers take over the responsibility for the end of life management of their used products. This can include collection, sorting and treating these for their recycling and recovery. The policy first appeared in the early 1990s in a few European Member States, especially for packaging waste, and has later on expanded across the EU and beyond. Since then, EPR has contributed to significant increases in recycling rates and public spending savings on waste management. The legislative framework for the development of EPR at the European Union level is composed of both general waste legislation, and specific directives framing the recovery and recycling of specific waste streams. The Waste Framework Directive (2008/98/EC) sets the general framework for waste management in the EU. It enables Member States to set up EPR schemes. The EU has moreover issued waste stream-specific directives, inter alia for packaging, waste electrical and electronic equipment (WEEE), end-of-life vehicles (ELV), batteries and accumulators (B&A). While WEEE, ELV and B&A require Member States to set up EPR for the products they cover, there is currently no obligation to set up EPR schemes for packaging. However, at least for household waste, most Member States (25 out of 28) have chosen to do so. Today, almost all EU countries and developed economies have EPR programmes and policies in place. Such programmes are also in the scoping stage in some developing countries in Asia, Africa and South America. Nonetheless, the specific features and outcomes of these measures vary significantly across regions, countries and industries.
32. According to OECD there are four broad categories of EPR instruments at the disposal of policy makers. These typically address specific aspects of waste management, and can be implemented concurrently. These include: (i) product take-back requirements obliging producer or retailer to collect the product at the post-consumer stage, to achieve recycling and collection targets of the product or materials or providing incentives for consumers to bring the used product back to the selling point. (ii) economic and market-based instruments, including measures such as deposit-refund schemes, Advanced Disposal Fees (ADF), material taxes, and upstream combination tax/subsidy (UCTS) that incentivize the producer to comply with EPR. (iii) regulations and performance standards such as minimum recycled content. (iv) accompanying information-based instruments aiming to indirectly support EPR programmes by raising public awareness. Instruments across these four categories can be implemented as mandatory policies or alternatively be applied on a voluntary basis by producers themselves.
33. Generally, the EPR has the following goals: (i) to provide incentives for eco-design that allows the producers to establish an efficient end-of-life management for their products and spurs them to design products that are easier to dismantle, reuse and recycle. (ii) to create a sustainable production and consumption policy through encouraging separate waste collection and recycling, (iii) to reduce landfilling and develop recycling and recovery channels. The benefits from implementing EPR scheme include: increased collection and recycling rates, reduction of public spending on waste management through shifting responsibility from local public authorities onto producers (and ultimately to consumers), reduction in overall waste management costs through optimized cost efficiency of collection and recycling operations and implementing design for environment (DfE) innovations increasing the durability and reusability of products. In addition to the benefits identified above, EPR programmes are also believed to generate a range of broader benefits, including increased technological and organisational innovation, a diversification of sources of material supply and therefore a contribution to resource security, and a better organisation of supply chains through the emergence of more international operators in the recycling sector.

34. EPR is an individual obligation as companies that place products on the market are responsible for their proper end-of-life management. In practice, however, producers often work collectively to exert this responsibility by setting up Producer Responsibility Organisations (PROs), which are also called EPR or compliance schemes. PROs should be non-profit collective entities, set up and fully owned by the industry that is bound by legislation. Therefore, PROs become responsible for meeting recovery and recycling obligations on the industry's behalf. Some PROs have a public service mission and operate in a non-for-profit or profit-not-for-distribution basis, but others, owned by investors and/or the waste management industry, actually seek profit. Generally, PROs exert the following functions: (i) organise, often together with the local authorities, the take back of post-consumer products; (ii) ensure recovery and recycling targets compliance; (iii) assist companies in (packaging) waste prevention and eco-design promotion; (iv) increasing public awareness and providing communication materials towards the waste holders, together with the local authorities; (iv) verifying the data and reporting of the obliged companies and (v) reporting to national/entity authorities.
35. EPR can be implemented in many different ways and not all PROs have the same functions. As EPR requirements differ between countries, the role of PROs vary as well. Most of the systems are limited to organisational and financial management tasks. The collection and recovery services are subcontracted by the system and carried out by specialized companies. These contracts are normally awarded on the basis of a tender procedure. Some systems have established different entities in charge of certain activities and materials (e.g., within the ARA system , ARGEV is responsible for metal packaging, ARO for packaging made of paper, etc.) whereas other systems are active on a cross-sectoral basis (e.g., DSD). Key differing features include (i) type of responsibility, either financial or organisational; (ii) presence of competition among PROs and among waste treatment operators, and (iii) transparency and surveillance features such as free-riders' surveillance, waste management activities and PROs.
36. The EPR scheme can be compared based on the following main criteria:
    a. Individual or collective scheme (PRO). Individual collection and treatment schemes are mostly applied in business-to-business contexts characterized by a limited number of actors. Usually, though, producers organize and finance collective Producer Responsibility Organizations (PROs) that will carry out the collection and/or recycling of end-of-life products on behalf of their members.
    b. Organisational versus financial responsibility. The responsibility for waste management imposed on producers may either be financial or organizational, or both. In the first case, individual producers or PROs pay fees to municipalities, which remain in charge of waste management operations (usually the collection), while recycling is outsourced to specialist contractors. In the case of organisational responsibility, producers and PROs will finance and organise waste management operations and contract directly with recyclers.
    c. Allocation of responsibility among stakeholders. The main objective of EPR is to shift responsibility for managing a product's end-of-life from municipalities to producers. In most schemes, however, municipalities remain in charge for some aspects of the organisation of waste management.
    d. Cost coverage. The cost coverage of waste management operations refers to two issues: first, how to define and calculate the full costs of managing a product's end of life under EPR; and second, whether producers bear the full costs, and if not what should be the allocation of costs assumed by different stakeholders.
37. According to the organization Extended Producer Responsibility Alliance (EXPRA) the following EPR models can be considered:
    e. PROs in hands of obliged industry (Belgium, Czech Republic, Ireland, Italy, France, Netherlands, Norway, Portugal, Spain): Obliged industry creates one common non -profit entity that collects the necessary funding, cooperates with local authorities and ensures recycling in the most cost-efficient and environmental way.
    f. Dual model (Austria, Germany, Sweden): Industry has full operational and financial responsibility over collection, sorting and recycling. There is a separate collection system designated to local authorities but their influence is minimal.

g. Shared model (France, Spain, Belgium, Netherlands, Italy, Czech Republic, Slovenia,): The responsibility is shared between industry and the local authorities based on common agreements regarding collection. Municipalities are responsible for collection, and often for sorting of packaging waste, arising on the municipal level, while industry's financial responsibility differs from country to country.
h. Tradable Certificates Model (UK, partly Poland): There is neither a link between industry and municipalities nor differentiation between commercial and packaging arising at the municipal level.
i. Vertical integrated systems (Germany, Poland, Slovenia, Romania, Bulgaria): Several, usually profit-oriented entities compete to attract obliged companies
j. Sharing the collection infrastructure (Germany): Inhabitants have access to a common container and the collected packaging waste is split between the various PROs prior to being sorted. In this case, the cost distribution is established by a clearing house.
k. Competing on the infrastructure (Estonia): Every PRO offers its own container to inhabitants.
l. PROs only responsible for packaging arising at the municipal level (Belgium, Germany, France, Spain), for commercial packaging (Belgium), or for integrated packaging waste streams (Netherlands, Italy, Czech Republic).
m. Each PRO in a separate district (Poland, Romania, Bulgaria, Slovakia, Malta, Latvia, Lithuania): Each PRO signs up with as many municipalities as needed to fulfil targets according to market shares.

38. The different EPR schemes apply different fee structures. Major factors influencing relative compliance costs include: (i) existing collection and recovery infrastructure in the waste management sector, (ii) the source of packaging used to meet national recycling quotas (household only or all packaging), (iii) the proportionate share of costs which industry bears, (iv) national recycling quotas, (v) collection system used, (vi) geographic location and population density and (vii) applied enforcement measures. Labour costs and general overheads also differ depending on the prevailing local economic conditions.
39. The types of costs covered and the prices for recycling charged by the various systems for packaging waste differ to a considerable extent. All of the systems have licensing fees per quantity of material (e.g. EcoPack Bulgaria, CONAI in Italy, Latvijaz Zalais Punkts). Different system use different fee per material structure. Some systems have different fees for household (sales) packaging and commercial/industrial (group, transport) packaging (e.g. Cyprus Green Dot, EKO-KOM – Czech Republic, ERO – Estonia, Green Pack in Malta). Some systems have different fees depending on the packaging size and volume (e.g. ARA in Austria, Gront Punk Norway). Some system have additional fees per unit of packaging (e.g. HERRCO in Greece) or minimum fee per packaging unit (e.g. Fost Plus in Belgium). Some of the systems charge participation fee as a flat fee per tonne (e.g. Repak in Ireland) or have set a minimum licensing fee per company (e.g. EcoPack Bulgaria) or standard fee for companies with low packaging amounts and/or joining fee (e.g. REPA in Sweden). In several cases, discounts from the standard fees are provided for certain categories of clients. For example, Ecopack Bulgaria gives a 10% discount for in-time submission of monthly reports and additional 10% for in time payment. As it becomes apparent, a straightforward comparison is not possible, as the materials are grouped in a different way in each separate country. Besides, in some of the countries additional membership and other fees apply, as well as various types of discounts. Nevertheless, it can be concluded that the licensing fees for packaging placed on the market in FBiH are lower than in the neighbour countries, and considerably below the levels set in countries like Austria, Belgium and Germany where the recycling of packaging waste is well established. The fees charged by the operator in RS are several times higher than fees charged by EKOPAK in FBiH. They also exceed fee levels in most of the Central and Eastern European Countries, applying higher recycling and recovery targets.

Alternatives to implement an EPR scheme

40. The establishment of EPR system for packaging waste proved its efficiency in many countries. Nevertheless there is no unique best solution that can be directly transferred to other countries. The

various EPR systems differ significantly from each other and they were gradually developed and adapted to fit with the needs of the individual countries. The EPR system shall take into account the specific conditions in place, especially geographical conditions, level of economic development, legal system, current level of waste management services, people behaviour and standard of living, existence of recyclable waste markets, etc. The PRO is the main element for the implementing the EPR system. The PRO is a collective compliance scheme established on behalf of the industry, responsible for the organizing of separate collection and achievement of recycling and recovery targets on behalf of producers and importers of packed goods on FBiH/RS market. In the implementation of these duties the PRO interacts with various stakeholders such as producers and importers of packed goods, entity and local authorities, waste management companies, recycling plants and citizens using the separate waste collection services.

41. **Responsibilities for organizing the system**. The responsibility to organize the management of packaging waste and WEEE is usually delegated to the responsible industry and implemented through PRO. Nevertheless, there are few examples of waste management schemes organized by the state (e.g. Hungary and Croatia). The implementation of Fund managed scheme in FBiH/RS will require the obliged companies to report the packaging quantities placed on the market and pay a product tax to the respective Fund. The revenues collected in this way will be used to develop the necessary separate collection and sorting infrastructure and finance the implementation costs. The municipalities will be entirely responsible for the development of household collection scheme for packaging waste and certain categories of WEEE. The Fund will provide fully or partly the financing of initial investments on project basis and according to application submitted by local authorities. Standard requirements for separate collection systems shall be developed, including type of eligible equipment and costs, container volumes provided per capita, collection frequency, costs per capita, etc. Direct financing of initial investments by municipalities and/or PUCs shall not be expected based on limited financial resources available. The operating costs can be financed in different ways. They can be financed directly by municipalities/PUCs based on fees charged to households and taking into account the revenues from the sales of recyclable materials. In this case, the implementation of separate collection system will lead to an increase of municipal waste fees. Alternatively, the municipalities/PUCs can be reimbursed for the occurring net operating costs for collection and sorting of packaging waste. The payments from the Fund shall be based on quantity of waste sorted for recycling. Prior the payment the PUCs/municipalities shall be required to submit evidences for the quantities of waste collected separately, sorted and delivered for final processing. The payments per tonne for the different types of packaging materials shall be same for all municipalities. Differentiated payment for rural and urban areas can be considered as possible option. Payment of additional bonuses to municipalities for the achievement of minimum separate collection and recycling rates is advisable. In principle, the Fund shall not finance investments of municipalities or private sector into establishment of new recycling infrastructure. The recycling of waste shall rely entirely or private initiative and will be developed on commercial and competitive basis. In case of WEEE, the Fund will have to pay the related transportation, dismantling, treatment and disposal costs. Some of the collected WEEE like luminescent lamps, TVs, etc. have a negative value. The contracting of these services will be based on open tender. Under the Fund managed scheme the municipalities/PUCs will be the major beneficiaries of funds for development of separate collection systems for packaging waste and WEEE with household origin. The private sector involvement will be limited but still possible under the contract with the respective municipality. The main advantages of the Fund managed scheme are the less complicated institutional and organizational arrangements and the potential for economies of scale because of sharing municipal infrastructure used for collection and sorting of residual waste. The disadvantages of this approach are significant: (i) the size of the tax do not address the actual costs for separate collection, sorting and treatment; (ii) risk for overspending of funds and investments in unnecessary, inappropriate or oversized municipal facilities; (iii) lack of clear responsibilities for the achievement of recycling and recovery targets; (iv) the Funds have less experience in trade with recyclable waste commodities compared to the private waste management companies; (v) the State organizations as a presumption are less flexible than the private sector. In addition, the contracting of private companies to operate the separate waste collection and sorting will be practically not

possible for the Fund because of the complicated public procurement procedures. Most likely, the majority of the funds will be channelled through municipalities and respectively designated to PUCs. Considering that local authorities have serious difficulties in organizing collection, treatment and disposal of (residual) municipal waste, it's very unlikely they to be more successful and efficient in developing separate waste collection and sorting of recyclable waste on their territories. The major experience of the Fund is related to project financing and management. This is quite different from the packaging waste or WEEE system where the operating costs shall be financed. Based on the above, the implementation of public fund managed schemes for packaging waste and WEEE is not recommended for implementation in FBiH and RS. Nevertheless, considering the current issues with the functioning of PRO for packaging waste in the RS, this alternative shall not be completely rejected.

42. **Division of responsibilities between the EPR scheme and local authorities - full or shared responsibility models**. The decision about the distribution of responsibilities between the PRO and the local authorities in organizing separate collection and sorting of packaging waste and for the collection of WEEE from households is crucial for the entire functioning of the system. As already explained the role of PRO can be limited to financial responsibility or alternatively the obliged industry will have also responsibility to organize and implement the necessary separate collection and sorting services. In case of full responsibility scheme, the financing of initial investments for separate collection and sorting infrastructure will be responsibility of the PRO, either directly or through the contracts with service providers. Private sector will be contracted by PRO to provide the separate collection and sorting services and PUCs can participate in this process on competitive basis. In case of full responsibility scheme there will be no financial flows from the PROs to municipalities. In shared responsibility model, the municipalities will be responsible to organize the separate collection and sorting in a similar way like the collection of residual waste and the PUCs will play the main role in the delivery of separate collection services. Municipalities/PUCs will be owners of separately collected waste. The PROs will cover the separate collection and sorting costs based on contract with the respective municipality. The payments from the PROs to municipalities can be proportional to the quantities of recycled materials or number of residents served. Comparing the two alternatives, an EPR scheme based on full responsibility of the obliged industry is considered more beneficial for the future implementation in FBiH and RS. The arguments supporting this recommendation are that the municipalities and PUCs have very limited experience in organizing separate collection and sorting, the municipal infrastructure for separate collection is practically not available, the public sector is less flexible to accommodate to the change in situation and the municipalities have limited experience in the trade with recyclable waste commodities. Nevertheless, it shall be taken into account that a shared responsibility model was successfully implemented in several EU countries. The shared responsibility model can provide substantial support and additional revenues to Public Utility Companies. It will also allow for better utilization of public municipal waste infrastructure that could be used for sorting of separately collected waste. At the other side the full responsibility model, suppose larger involvement of private sector in the service delivery. Another possibility is the legislation to allow the implementation of both alternatives and the cooperation modalities to be decided on case-by-case basis in the agreements signed between the PRO and the respective municipality.
43. **Cost coverage and financing of the system**. The full responsibility of the obliged industry suppose the PRO to cover the full costs for organizing separate collection and sorting of packaging waste. In case of shared responsibility between the obliged industry and municipalities, a cost sharing is also possible. The PRO will still cover the major part of the costs but the municipalities will have to cover the costs for non-packaging recyclable materials collected through the separate collection system. It also shall be pointed out that the PRO will apply standard and unified requirements for all municipalities and the implementation of individual conditions for each municipality will not be possible. In practice, this will mean that the different municipalities will receive from PRO the same payment per tonne of packaging waste collected, sorted and delivered for recycling. A more fair solution could be to categorize municipalities in several groups based on the population size and density and the type of separate collection system established and then provide same cost sharing and payment conditions for all municipalities within the same group. Even in this case, the actual

costs for separate collection and sorting will be different in different municipalities because of the different population size, distances to the sorting facilities, distances to the recycling plants, consumer behaviour, collection rate achieved, sorting efficiency, etc. Receiving same payment per tonne will mean that some municipalities will be able to cover the full costs for the organized separate collection services while in others the revenues received from the PRO and from the sales of the recyclable materials will not be sufficient to cover the full costs. In this case, the separate collection costs shall be partly financed through the fees charged to households or through transfers from municipal budget. Overpayment from PRO to municipalities is also possible but unlikely. The other issue when applying shared responsibility model is that the costs to implement a separate collection system, the revenues from the sales of recyclable materials and the treatment and disposal costs for certain WEEE categories will change over time. In order to guarantee a financially sustainable functioning of the system an appropriate price adjustment mechanisms shall be agreed between the PRO (obliged industry) and the municipalities. Considering the limited financial resources of the municipalities and PUCs the sharing of costs for the implementation of separate collection and sorting is not considered an appropriate approach for the coming years.

44. **Household vs non-household packaging**. In few EU countries the scope of collective systems to household packaging is limited to household packaging in others it involves all packaging materials (e.g., Germany). In other countries, collective systems may be set up both for household and commercial packaging (e.g., Austria). In the latter case, legislation sometimes requires a separation of the cost structures of the household and the commercial sector (e.g., Austria). In Belgium two PRO operate separately for household and commercial packaging. The present legislation in FBiH and RS does not limit the responsibilities of PRO to certain categories of packaging. The separate collection and recycling of household packaging waste is practically not developed at present and this is the main argument of the authorities in both FBiH and RS to question the efficiency of the EPR systems in place. The achievement of recycling and recovery targets relies entirely on the commercial and industrial packaging waste collected and the materials delivered by the informal sector. The present recycling and recovery targets are considerably below the levels prescribed in relevant EU legislation and their increase in the future will require gradual implementation of separate collection systems for household packaging waste. The achievement of such objective will require setting up clear objectives and obligations for the PRO to develop, organize and finance the separate collection system. The following policy and legal measures are possible: (i) to limit the responsibility of PRO to household packaging; (ii) to set separate targets for recycling and recovery of household packaging waste; (iii) to set minimum requirements and objectives for the separate collection systems for household packaging waste that have to be achieved by the PROs.
45. **Competition on market**. Most EU countries did not grant exclusive or special rights to companies operating collective systems. Their laws do not prohibit the creation of alternative systems. In some countries one cross-material system predominates (e.g. ARA in Austria, Eco Emballages in France, Fost Plus in Belgium, EKOKOM in Czech Republic) or one material-specific system predominates per material (e.g., Svensk GlasAtervinning for glass in Sweden). Competitors usually only operate at the market fringes, either by offering individual solutions for specific sectors or by offering systems for specific sectors or materials. In other EU Member States alternative cross-sectoral and cross-material systems exist but their market shares are appreciably lower than those of the respective ”leading” systems. The legislation in FBiH and RS impose some limitations on the number of PRO organizations operating on market but also allow competitive operation of several systems. Presently two operators received permits to deal with packaging waste and two for WEEE in FBiH. In a case of multiple competing PRO’s acting both on industrial/commercial and household flow, among which the companies are free to choose in order to fulfil their obligations, creating a fair playing field is a must. The following major problems shall be addressed: (i) producers choose the lowest offer on the market having no possibilities to compare and analyse the PRO’s activity and taking advantage on their position on the supply chain, (ii) waste management companies acting in industrial/commercial stream increase some of their cost taking advantage of changes in demand, (iii) multiple PRO’s running for IC packaging (cheapest solution) avoiding household collection specific costs in order to keep their clients, (iv) PROs generate underfunding situations on the supply chain. The existence of more than one PROs presumes the establishment

of clear rules and procedures for fair distribution of tasks between the market participants and the achievement of recycling and recovery targets cannot be the only criteria for their functioning. Two main approaches are possible: (i) to set up a special entity (clearing house) with the purpose to distribute and verify the implementation of tasks by the different operators, including the allocation of financial responsibilities or (ii) the national legislation to precisely define the procedures for distribution of responsibilities between PROs. Usually this is based on dividing service territory proportionally to the market share of PROs. Considering that the markets in FBiH and RS are small the operation of several PROs is not justified.

46. **Clearing House** is an independent institution functioning on a competitive market with the purpose of regulating the PRO's activities referring to packaging or WEEE collection from households. Industrial-commercial flows are regulated by the supply and demand ratio. The Clearing House must act as independent body initiated by the producers themselves (Compliance schemes, industry associations), or independent entity from the obliged industry (Chamber of commerce) should be subject to strong public surveillance and should also maintain a strict separation of financial interests from any specific PRO's.
47. **Territorial coverage**. Another question that needs an answer is whether the separate collection shall be organized on the entire entity/national territory or focused only to these areas where efficient collection process can be organized. Considering that the collection of municipal waste is not well developed in the rural areas it shall not be expected that the separate collection can go further. The following possibilities shall be considered: (i) organizing separate collection in all areas where collection of residual waste is organized, (ii) setting up objectives for the minimum number of residents served as percentage of total number of residents or (iii) setting up a threshold limit for the minimum number of residents living in settlement above which the separate waste collection services shall be obligatory. For example, the system can be organized in all settlements with population exceeding 3000 residents and in all settlements with population between 1000 and 3000 residents located within 15 kilometres from a settlement with population above 10000 residents where separate collection is already established. In the initial years, the separate collection of packaging waste shall focus mainly on large settlements and gradually extend to rural areas.
48. Another very important question is whether all PROs shall organize the separate collection services at entity level or the territory where services shall be established will be divided between the PROs. This issue is more relevant for the FBiH where two operators are licensed at the moment but similar situation could appear in RS in the future. If individual PRO shall provide service on the entire territory of FBiH that will mean each municipality implementing separate collection to have contracts will all PROs posing permits issued by competent Ministry. In case that obliged industry has the full responsibility to organize the system, all PROs will have to establish their own collection and sorting infrastructure. That means separate collection containers of the different PROs to be installed for the same material in each municipality. This cannot happen practically and the industry will have two possibilities: (i) to merge the activities of the two existing operators and have only one PRO per waste stream operating at entity level or (ii) to set up a clearing house or equivalent structure to divide the responsibilities between the several PROs. This is not a realistic scenario because has to be agreed with the authorities, will require tendering of separate collection and sorting services and supposes financial transfers between the PROs. The full coverage of the entity territory by the system is possible to be implemented based on shared responsibility between the obliged industry and local authorities. In this case, again a clearing house need to be established in order to divide the payments between the PROs and channel the funds to the municipalities implementing separate collection. The development of such system for a small market like FBiH or RS is very disputable because of the high administrative costs for the functioning of clearing house and the expected implementation difficulties. Considering that all PROs will have same costs per tonne of household packaging collected and practically no competitive advantages with regard to collection system, the existence of several operators is not justified. In case that service areas are divided between two or more PROs, there will be a competition among them for signing contracts with larger municipalities where the generation rates of recyclable waste are higher and the collection and sorting of waste is more economically viable. Legislation on EPR for municipal waste streams should avoid cherry picking between collection areas and insure the same quality

and accessibility of collection service nationwide, with a homogeneous, coherent system in terms of image and communication, organised at the local and/ or regional level.

49. **Waste ownership**. The issue who owns the waste collected and sorted shall be considered in case that PRO will have the full responsibility to organize the system. Presently the PRO does not own the waste collected by the private operators or municipalities/PUCs. The private waste collection companies deliver waste to the recycling plants on behalf of the PRO but at their own expense. Alternatively, all waste collected and sorted for recycling that is counted for the achievement of recycling and recovery targets on behalf of the EPR system could be owned by the PRO.
50. **Technical aspects**. It is wise to implement an appropriate set of pilot projects before launching full scale operations in order to test different collection methods. The existence of individual collectors requires the efficiency of collection systems based on separate collection containers or plastic bags to be initially tested prior to their eventual implementation at national/entity level. The chosen technical solution to implement the separate collection and sorting has direct influence on the amounts and quality of the collected materials and the related costs. To the extent possible, the new system shall build on the existing recyclables collection/sorting activities, including and involving the informal/semi-formal sector. Basically, there are two main forms of collection – door-to-door collection and bring system. The different collection systems are associated with different quality of the collected recyclables and with different costs. There are few general rules which shall be taken into account when deciding about the appropriate system. The bring systems require more efforts from citizens to reach the containers and discard sorted fractions. It is also very important that in this case, the person discarding waste is anonymous and relatively high level of impurities and even residual waste must be expected. In practice that means a lower public participation than at kerb-side systems, lower amounts collected and higher amounts of sorting rejects obtained. The kerb-side collection systems achieve higher collection rates compared to the bring systems but they are more expensive. It's also important that the quality of the collected materials is higher in case of kerb-side collection. In general kerb-side collection needs to be applied in case that recycling and recovery targets cannot be achieved via the drop-off system or when there is limited time available to convince residents to participate in the separate collection. Another very important issue is that once a kerb-side system is established using individual bins or plastic bags, it is extremely difficult to switch to a drop-off system collection and convincing people to walk longer distances to discard their waste. The same applies for the number of sorted fractions. Once people get used to sorting plastics, paper and metals together and discarding them into one bin, it is difficult to convince them to start sorting these materials separately and throwing them into separate bins. Another important decision to be taken is the container types to be used. The size of container has impacts on quantity, composition (quality), volume, weight and unit size of waste collected.
51. **Inter-entity issues**. According to present institutional set up, the management of packaging waste and WEEE is organized at entity level. The existence of two independent systems functioning on relatively small national market is not an optimal solution that leads to high administrative costs for the PROs in both FBiH and RS. For example, in Belgium that is a country with a similar administrative division one scheme for packaging waste is operating at national level. Setting up a national EPR scheme for packaging waste or WEEE to operate in all entities is not possible and realistic within the existing institutional and legal framework. Nevertheless, the basic preconditions for implementing a unified approach in both FBiH and RS already exist: (i) the waste management laws and regulations for packaging waste adopted in FBiH and RS have many similar elements, (ii) the competent authorities at entity level and the Environmental Funds have similar structure and functions and there is a good communication between these institutions and (iii) the existing inter-entity steering committee for the environment could play the administrative role to coordinate the implementation approach. The possible approach to unify the systems could be one operator to obtain permits to set up packaging waste management systems in both entities, or the operators licensed in the different entities to coordinate their activities based on cooperation agreements. If unified approach applies that will allow the obliged companies (producers and importers) to have a single point of contact no matter of their place of registration or core activities in the country.
52. **Management of packaging waste and WEEE in the District of Brcko**. The implementation of separate EPR system in BD is not considered an efficient solution due to the small population and

territory and respectively the small quantities of packaging waste and WEEE. In this regard, it will be more appropriate if the obliged companies placing packed goods or electrical equipment on the market in BD are allowed to sign contracts with the PROs licensed in FBiH and RS. They will have to declare the quantities of packaging or electrical equipment sold in BD and pay the respective service fees to the operator. The operators will transfer the funds collected to BD, retaining small percentage of fees for covering the administrative costs. The entire process shall be agreed in the inter-entity steering committee and can be implemented through cooperation agreements to be signed between the BD and the EPR system operators licensed in FBiH and RS. Alternatively the BD can develop a legislation on EPR based on shared responsibility model. Such system can work efficiently only in case that existing operators in FBiH and RS apply and obtain a license to operate in BD.

Recommendations

53. The results achieved so far in implementing separate collection and sorting of packaging waste are not satisfactory and the present recycling levels are far below these achieved in other European countries. FBiH and RS face similar problems and the need of taking corrective measures is well recognized by the competent authorities. The obliged industries in both entities are obligors to the society and significant additional efforts will be needed to develop appropriate separate collection systems and to establish modern infrastructure for the sorting and treatment of waste. The waste management issues and in particular the recycling and separate collection shall become a real priority for the local authorities. Gaining a public support for the implementation of waste separation at source and the participation of significant share of citizens into different recycling initiatives will require more resources to be designated for an extensive communication and awareness programmes. The dialog between all stakeholders including industry, entity authorities, municipalities and waste management companies will be crucial for the successful implementation of legal requirements. The progress will only be possible if all stakeholders work together for the achievement of common objectives. As EPR is strongly linked to a public service, transparency is a primary requirement in its implementation. Transparency is necessary to the extent that entity/national governments can control the proper implementation of EPR and both producers and consumers can make informed choices. Not at the last place significant progress in the management of packaging waste and WEEE will not be possible without achieving general improvement in the municipal waste management practices in the country. Significant efforts will be required to rebuild the trust and improve cooperation between the public authorities and the private EPR schemes. The implementation of efficient and cost effective system for the management of packaging waste and WEEE requires substantial changes in the existing legal requirements, organizational set up and operational practices at all levels.
54. Key recommendations of the Reform Plan for municipal waste include (i) Setting up of a reliable statistical information system by improving the cooperation between the various organizations collecting statistical information, introducing a practical reporting system based on weight- based data; (ii) Improvement of the waste collection coverage from 67% up to 85-90% by renewing and extending the collection fleet; (iii) Further harmonisation of legislation with EU Directives meeting the affordability principle and strengthening the enforcement of its implementation; (iv) Reduction of cost increases as a result of shifting up in the waste hierarchy by creation of more efficient waste collection systems based on regionalization and reducing the costs for waste collection companies; (v) Strengthening of the institutional framework at Entity (ministry), Cantonal (cantonal ministry) and Local (municipality) level by reforming the organizational structure such as the creation of specialised SWM sections; (vi) Involving all stakeholders in the development of improvements especially the Association of Municipalities and the professional umbrella organisations such as BASWA and Association of Communal Utilities for advice and dissemination of information; (vii) Introduction of regular public communication and awareness programmes by municipalities including budget allocation obligation for this activity; (viii) Creation of financially sustainable services by reforming the tariffs and the tariff collection system; (ix) Revisit and enhance the regional landfill concept and allocation of the service areas based on the experience gained during

the past 17 years; (x) Introduction of environmental taxes to enforce compliance with the objectives of the Reform Plan such as introduction of environmental tax on usage of non-compliant landfills; (xi) Preparation of investment projects to improve collection, transport, separation and disposal of MSW including capacity building at all levels. The recommendations presented below are specific for the EPR systems for packaging waste and WEEE.

55. **Legal aspects**. The existing legal requirements provide a good starting point for implementing extended producer responsibility systems in BiH. The entity authorities in FBiH and RS already adopted a set of legal requirements in the field of packaging and packaging waste. Despite of the minor deficiencies, the regulations in both entities adopted a significant step to define the framework for the functioning of the EPR system. Future amendments in the legal requirements shall focus on: (i) achievement of full transposition of the requirements of EU Directive on packaging waste, (ii) better definition of the responsibilities of the municipalities and the interrelations with the system operators in the establishment of the necessary separate collection and sorting infrastructure, (iii) review of the present documentation and reporting requirements, (iv) review of the recycling and recovery targets for packaging waste; (v) optimizing the requirements and the existing procedures for the application, issuing and withdrawal of permits for PRO, (vi) possible review of the procedures for calculation and payment of fees for packaging placed on the market, (vii) review of the format and scope of the annual reports submitted by the PROs, (viii) considering the possibility for auditing the annual reports of the PRO and for verification of quantities of packaging declared by the individual companies, (ix) establishment of transparent and fair mechanisms for the division of responsibilities between several PROs operating at entity level and (x) establishment of appropriate mechanisms to enforce the legal requirements. With regard to WEEE, the FBiH has adopted an appropriate legislation at entity level. It will be beneficial for the implementation process if following changes are considered: (i) establishment of register of the producers and importers of electrical and electronic appliances, (ii) review of the WEEE collection targets in line with the provisions of EU directive (4.0 kg per capita per year for household appliances), (iii) defining role of local authorities in the development of necessary collection infrastructure for household WEEE, (iv) better definition of responsibilities of the retail sector to take back old appliance at the time of sell and/or supply of new appliance, (v) establishment of clear mechanism for the division of responsibilities between several system operators and (vi) review of the scope and content of the annual reports submitted by the system operators. The process in RS is at the initial stage and entirely new legal requirements on WEEE need to be introduced. Most likely, amendment of the existing Waste Management Law and adoption of new Regulation on WEEE will be necessary.
56. **Waste management plans and programmes**. The current Federal Waste Management Plan in FBiH will expire in 2017 requiring the development of a new 5-year Plan. The development of the new Plan needs to follow a participatory approach where all relevant cantonal authorities are involved in planning the regional and inter-cantonal waste management solutions. A Waste Management plan for RS shall be developed in line with the provisions of legislation and Strategy approved in 2017. Missing Cantonal and Municipal Waste Management Plans need to be developed. Development of specific implementation plans or programmes on the Directive of Packaging and Packaging Waste and the Directive on WEEE can additionally support the implementation process. Development of new Waste Management Plans at entity level need to follow a participatory approach where all relevant authorities at entity, regional and local level, the representatives of business and professional associations and non-governmental sector are involved.
57. **Institutional aspects**. The specific responsibilities of the competent entity authorities in charge of packaging waste and WEEE management need to be defined and these to be provided with the necessary capacity to monitor, control and enforce the requirements of packaging regulations. Legislation should provide a clear framework defining the responsibilities of different stakeholders and how the separate collection, sorting and treatment cost will be financed. Special attention shall be given to the role of the local authorities in organizing separate collection in their territories. In FBiH, the FMET, cantonal ministries responsible for waste management and municipalities urgently require strengthening to play their crucial roles in environmental monitoring and

enforcement, and information collection, reporting and database management including analysis of information (e.g. in terms of meeting the targets). In line with this a review of their organization and operations has to be carried out, including staffing, tasks, bottlenecks (especially (un)availability of financial resources), shortcomings, etc. and recommendations to improve their performance. It is recommended that a distinct Solid Waste Management section be created in FMET, responsible for planning, preparation of legislation, coordination, supervision and monitoring of waste management on entity and regional level, in close cooperation with FEP of FBiH, cantons and municipalities. Executive tasks of the Ministry could be delegated to an "Environmental Protection Agency" possibly to be created by re-organizing the FEP. Similar administrative changes will be required in the RS. It is recommended to create a distinct Solid Waste Management section at MSPCEE responsible for preparation of guidelines, planning, coordination, supervision and monitoring of waste management on republic level. Based on the experience from other countries at least one person in the respective sectoral ministry shall be in charge with the management of packaging waste. A second person will be required to deal with WEEE in combination with spent batteries and accumulators.

58. The municipalities need to be involved in the coordination bodies established for the implementation of regulations on packaging waste and WEEE in FBiH. Establishment of a similar coordination body in the RS could significantly support the implementation process. Such coordination bodies in both entities will provide the necessary platform for stakeholder consultations and will support the achievement of agreement about the division of responsibilities between the system operators and the local authorities. The Associations of Towns and Municipalities in both entities shall be constituted as formal partner in consultations with the system operators about the optimal systems for separate collection, sorting and treatment to be implemented in the future. Development and implementation of a standard contract can be a useful tool to unify the relations between the system operators and local authorities.
59. The capacities of the Federal Administration for Inspection Issues in FBiH and the Republic of Srpska Inspectorate need to be strengthened in order to provide efficient enforcement of legal requirements and reduce the number of "free riders". A review of their organization and operations, including staffing, tasks, bottlenecks (especially (un)availability of financial resources), shortcomings, etc., is key to inform recommendations for improving their performance.
60. **Objectives and targets**. A fundamental goal of EPR is to increase the collection and recycling of waste. Therefore, ambitious and clear targets need to be set. Also, clear objectives on household waste should avoid cherry picking of easily recyclable materials and products, either at the collection or dismantling phase. The targets for recycling and recovery of packaging waste need to be increased to the levels defined in the EU Directive on packaging and packaging waste. An ambitious but realistic time frame for the achievement of targets have to be agreed and defined in the legislation adopted at entity level. The preliminary estimate is that the higher targets can start to apply as from 2020 and then gradually increase till 2025. The targets for collection of WEEE with household origin will also need to be increased to the levels prescribed in the EU Directive on WEEE (4.0 kg per inhabitant per year).
61. Producers should be able to choose to meet their responsibilities on an individual basis or through a collective compliance mechanism, such as a producer responsibility organisation (PRO).
62. **Competition issues**. When choosing a collective compliance mechanism, it is important that it is designed in such way that producers cannot gain an unfair advantage over their competitors or avoid their responsibilities. Moreover, if legislation allows multiple PRO's to compete for the same waste stream, it should be ensured that they operate effectively together and without jeopardising the achievement of policy targets. The existence of several PROs on small markets like FBiH and RS could cause significant and disproportionate administrative costs, reduce the possibilities to gain benefits from the economy of scales and significantly limit the possibilities for investments in new sorting and treatment infrastructure. The obliged industries in FBiH and RS have the sole responsibility of finding optimal solution for the structuring of their activities. The industry associations like Chambers of Commerce can take more active role in setting up EPR schemes and in the coordination of the implementation process between the obliged companies. A new administrative structure shall be established to take the functions of a "clearing house" in case that

more than one system operator is licensed to operate at entity level. The issue is more relevant for FBiH but same situation can appear in RS in the future. Initially the role of of clearing house can be performed by the Funds or Coordination bodies in both entities.

63. **Documentation and reporting requirements**. Companies placing packaged goods on the market should be responsible for the calculation and documentation of packaging amounts. The documentation requirements should be based on the available accounting procedures in order to avoid unreasonable burden on the industry. The documentation shall be kept for auditing by the competent authorities. It is essential to put in place appropriate information and reporting systems, incl. reporting templates and procedures, availability of trained staff to process the collected data, developed specialized software, etc. The present reporting templates for the obliged companies placing packed goods on the market in FBiH and RS are already unified to a large extend and only minor revisions will be required. It is also advisable to review and revise the formats of the annual reports prepared by the system operators. These annual reports shall include information not only about the achievement of recycling and recovery targets for packaging waste and WEEE but also financial and technical data about the development of separate collection and sorting infrastructure, public awareness campaigns, etc. The annual financial statements of PRO shall be public and provided together with the activities report. The amount of packaging waste, respectively WEEE collected through different collection channels shall be documented and reported separately. Similar to the practice in EU countries the activities reports of the PRO as well as the financial reports shall be audited and verified by independent auditor prior to their submission to the competent authorities. In line with the provisions of the Waste Framework Direcive, the companies collecting, processing and recycling waste shall be also obliged to provide information to the authorities about the quantities of separately collected, sorted and recycled packaging waste and for the amounts of WEEE collected and processed. They should also provide the PROs with proofs for the quantities of recycled materials received on their behalf.
64. **Permitting and control of PRO activities**. The existing procedures for the permitting of PRO are recommended to be amended. In this situation the system operators (PROs) will have to apply for new permits. The permit of PRO for packaging waste can be issued based on the following information: preliminary detailed financial estimates for the chosen system for collecting, recycling and recovery of packaging waste and evidence that it is financially secured what concerns the initial investment and operating costs; plan setting out the terms of contracts with municipalities and the minimum number of people to be served by the systems for separate collection of packaging waste, per year; measures to attract those who market packaged goods to join the PRO; plan of the quantities of recovered and/or recycled packaging waste by types of packaging materials; measures to be taken in the event of interruption or reduction of the levels of collected packaging waste and its subsequent recycling and / or recovery; plan for informing and attracting consumers to implement separate collection of packaging waste, including educational programs aimed at kindergartens, schools, etc.; measures for the recovery of packaging waste from households, administrative, social and public buildings, catering, retail and facilities for leisure, recreation and tourism; measures to compensate for any negative impact on the market price of recycled materials.
65. **Control and enforcement mechanisms designated to obliged companies**. An effective and efficient legal framework accompanied by adequate regulatory investigation and enforcement activity is a primary prerequisite for successful implementation of EPR. The administration should enforce this legal framework to close loopholes and trace free riders. The non-declared packaging amounts by the obliged companies in BiH is the most critical issue that limits the revenues in the system and breaks the fair competition practices in the sector. The obliged companies shall be subject to adequate control in order to guarantee that their financial contribution is proportional and the requirements of the legislation are met. Reducing the number of "free riders" will be of primary importance for the proper functioning of the system and requires immediate actions on behalf of authorities and the system operators. The proposed actions include: (i) Identification of all obliged companies placing packed goods on the market. This can be achieved through an improved communication and cooperation with Custom authorities, visiting shops and collecting information from the labels of different products, exchange of information between the Funds in FBiH and RS. (ii) Organizing inspections to the obliged companies selected on random principle or based on

activity and turnover criteria. The inspections can be implemented by independent auditors contracted by the Funds or by the competent inspection authorities. The costs for such inspections can be financed by the general fee paid by the companies placing packed goods on the market. The necessary funds shall be budgeted as administrative costs for the Fund on annual basis. (iii) The PROs should have the right and the obligation, on its own, or through its authorized representatives, to perform the necessary checks in order to prove that the clients, participating in the collective scheme, have calculated and paid the exact amount of the remuneration fee, as well as to receive samples of the packaging, which is subject of the contract. The members of EPR system subject to independed audit shall be selected on random principle and include approximately 5% of all contracted companies. The approach towards manufacturers and importers of electrical and electronic equipment can be based on the registration requirement contained in the EU Directive on WEEE and setting up a register of all companies placing electrical and electronic appliances on the market. The requirements for registration and the corresponding formats need to be defined in the legislation. Funds in FBiH and RS will be responsible to maintain the register. Import and sales of electrical and electronic equipment on the territory of BiH by non-registered companies will not be allowed.

66. **Trade mark issues**. The marking of packaging with a specific trademark indicating appurtenance to a specific PRO shall not be obligatory. The use of any trade mark shall be regulated by the legislation on trademarks and antimonopoly. The competent Ministry in charge with protection of environment shall not interfere in the relations between private companies that are obviously outside its functions and responsibilities. If certain company is considering to be affected by a miss-use of trademark or the holder of a trademark is assuming illegal use of its registered trademark by other entity they are free to address the issue to the competent authority or court.
67. **Financial aspects**. Establishment of a producer responsibility scheme to deal with packaging waste assumes that industry will be responsible for financing the separate collection and sorting of packaging waste. Considering the limited financial resources of the municipalities, the recommendation is that the obliged industry, through the PRO to cover the full costs of the system. The fees/product taxes charged by Funds in FBiH and RS will continue to play a role of a penalty for non-compliant companies. The existing charging mechanism and calculation formulas have to be reviewed and replaced with new clear rules. The possible charging mechanism can be as follows: (i) product taxes shall be imposed to all packaging materials placed on market, (ii) the tax is proposed to be defined in BAM per kilogram of packaging and shall have different size for the different packaging materials, (iii) the amount of the tax shall be calculated by multiplying the total quantity of the packaging put on the market during the reporting period with the amount of unit tax for the same material (coefficient). The annual recycling and recovery targets shall not be participate in the calculation formulas. The tax is recommended to be payable on monthly basis to the respective Fund. Tax exemption, annual payment or lump sum advanced payment can apply for companies placing small quantities of packaging on the market. Threshold values need to be defined. The size of the tax shall be high enough and above the actual costs for separate collection and recycling per tonne of the respective packaging material. This will lead to a significant increase of tax in FBiH and RS for certain packaging materials. The companies achieving the recycling and recovery targets individually and the producers and importers of packed goods who sign a contract with a PRO shall be relieved from the obligation to pay product tax to the Fund. The re-usable packaging can be exempted from the taxation or declared only once during its life cycle. It needs to be underlined that the purpose of product tax is to provide an incentive for the obliged companies to join the collective scheme implemented through PRO and not to generate additional revenue in the Fund. In this sense, the product tax shall be considered as a kind of penalty imposed on the obliged companies for non-achievement of recycling and recovery targets for packaging waste. The existing practice for covering the administrative costs occurring for the competent authorities through a general fee per kilogram of packaging placed on the marked is recommended to continue. The revenues from this fee should be used for the following purposes: covering the administrative costs of the Fund and the Ministry for issuing permit of PRO and for the control of its activity; maintain packaging waste quantities database; control of obliged companies; implementation of common public awareness campaigns.

68. **Greater involvement of the private sector** is likely to be necessary if the objectives are to be achieved within a realistic timeframe. For this to happen it will be necessary for government to address a number of critical issues to ensure that private firms are able to operate fairly and profitably on the market. Private sector involvement should be promoted in the area of waste collection and the management of specific waste streams under EPR. Various options for involving the private sector, either as operator through sub-contracting or as partner in a PPP have to be investigated in detail, especially concerning the legal and financial aspects. The conditions for cooperation under the various options should be prepared as part of a tender document.
69. **Setting up tariffs for services should be a sole responsibility of the PRO**. The respective PRO is free to decide about the fee structure and applied charging policy. It shall be recognized by the public authorities that the service fees charged by the PRO are not public funds and any interference in the business activities shall be avoided. In this respect, the existing limitations on the maximum allowed administrative costs for the PROs, operating in FBiH should be removed. The competent authorities shall focus on the actual result achieved and has nothing to do with the funds spent for the specific activities. Nevertheless, the plan prepared by PRO and submitted for approval from the MEPT as part of the permitting process, shall contain detailed cost estimates and justification that the proposed system is financially sustainable. The tariffs charged by PRO is recommended to be publicly announced and the PRO shall inform the Ministry for any change in the tariffs. Considering the present levels of tariffs charged by the system operators for packaging in FBiH, its obvious that they are significantly below the levels charged by the PROs in other European countries. The implementation of separate collection and sorting system for household packaging waste will not be possible to be achieved without significant increase of tariffs charged by the PROs in FBiH. All PROs are recommended to implement a fair and transparent tariff calculation processes that address the real costs and limit the possible cross material subsidies. The PRO have to guarantee that same conditions apply for all its members no matter whether they are shareholders of the company or clients. In this regard, agreement of individual prices/discounts shall not be allowed.
70. **Communication and public awareness**. Requirements for raising public awareness and educating society about the importance of waste recycling shall be established in legislation adopted at the entity level and all plans in the field of packaging waste. The target groups, key messages and communication channels need to be defined prior the start of EPR system implementation. Special attention shall be given to work with kids in first school classes.
71. **Markets for recyclable waste**. Markets for recyclable waste should not be viewed as a limitation factor for the achievement of the recovery and recycling targets in the country.
72. **Development of separate collection system for household packaging waste**. The competent entity authorities, in consultation with PRO and local authorities shall agree and define the minimum technical standards to be achieved by the separate collection systems for household packaging. For example such requirements can include: the minimum number of residents to be provided with separate collection of packaging waste; the type of the system; minimum volume of containers provided per capita/household; minimum collection frequency. Establishment of additional recycling targets for household packaging is not recommended at this stage. The separation at source and recycling have to become obligatory for commercial and industrial packaging and waste holders. The at source separation and separate waste collection could be made obligatory for all commercial, industrial and administrative objects with an area higher than certain threshold (e.g. area >100 square meters). The packaging waste quantities separately collected and sorted by the PRO should be reported separately for each municipality and divided between household packaging waste and waste of other origin.
73. The requirements for the separate collection of WEEE from households shall be defined in a similar way like for the packaging waste. Technical standards for collection and treatment of different WEEE categories will need to be developed and agreed in order to guarantee the minimal quality of the services. Such technical requirements can include: number of people served by a collection point; minimal technical requirements for the public collection points (municipal or private); minimal technical requirements for the collection (take back) points at the premises of retailers; requirements and guidelines for mechanical/manual dismantling and depollution. The obligation of the retailers will also need to be defined and can include: to inform buyers about the legislation

prohibiting the disposal of WEEE with regular household waste, the availability of collection systems, and the potential effects of hazardous substances contained in EEE on the environment and human health; to take back a used product upon purchase of a new product of the same type (an obligation call « one to one » take back); must take back for free, all the small household appliance (applies only for large retailer shops, e.g. with sales area > 200 m²).

74. **Sorting of separately collected waste**. Another important element of the packaging waste management system is to guarantee that all separately collected material is delivered and processed in designated sorting facilities. The PRO have to organize this process through contracts with specialized companies operating the necessary infrastructure. The PUCs can provide sorting services to PRO on competitive basis. The permits issued by the competent authorities need to guarantee that operation of the sorting facilities is in conformity with the recent technical standards and the applicable health and safety requirements. Each delivery of unsorted waste to the facility, the sales of the recyclable commodities and disposal of residues shall be recorded and documented in order to provide the necessary evidences for the future auditing of the system. The disposal of residues to the municipal landfills is recommended to be free of charge for the respective PRO/sorting facility and the related costs to be covered by the municipalities where the waste was separately collected. Any kind of EPR system that uses municipal infrastructure should guarantee a compensation of reasonable costs for the use of this infrastructure. In any case, local and regional authorities should not have any obligation to hand over collected waste falling under EPR if their reasonable costs are not covered by the producers.
75. **Financing of initial investments**. In line with the recommendation for the full organizational responsibility of the PRO for the separate collection and sorting of packaging waste from households, the operator shall guarantee the financing of initial investments. The initial investments for the purchasing of separate collection containers can be covered directly by PRO, while the collection vehicles and sorting infrastructure can be provided by the companies contracted to perform the respective service. In specific cases, the PRO can invest in sorting facilities and transfer the assets to specialized company contracted for the service. In case that PRO intends to operate the separate collection and sorting by itself it shall register a separate company and obtain the necessary permits. The separately collected waste and the sorted materials shall be owned by PRO and traded on its behalf. The PRO shall have contracts with recycling plants.
76. **Consultations**. Identification of all stakeholders potentially affected by the EPR system and setting up consultation process will support the implementation. These usually include the representatives of the business associations in the country, various branch chambers and associations, especially these from the FMCG sector, waste management companies, recycling industry, local (and regional) authorities, NGO. The involvement of representatives of large multinational companies could be of significant support for the discussion process. The changes in legal requirements shall follow the consultations with stakeholders involved and correspond to the agreed approach for the development of packaging waste management system. A permanent and productive dialog with public authorities must be established and all disputes shall be resolved in good will. A common vision and agreed implementation approach is a must.

1 INTRODUCTION

The institutional structure of Bosnia and Herzegovina (BiH) dates to the 1995 Dayton Peace Accords and assigns most power to the two entities: the Federation of Bosnia and Herzegovina (the Federation) and Republika Srpska (RS), plus the special district of Brcko. In both entities, municipalities are the key providers of essential public services, including solid waste management.

The SWM sector in BiH has advanced a lot over the past few years. Most notably, BiH has developed and is in a process of implementation of the regional landfilling concept. BiH is also improving its waste collection rates, has experimented with compliance schemes for packaging and WEEE under an extended producer responsibility (EPR) arrangement, has started to transpose the EU acquis into local legislature, and has set ambitious targets in its national SWM development strategies.

Despite this progress, significant sector issues and problems remain: waste collection is not universal especially in semi-urban and rural areas with coverage ranging from 68-80 percent; environmental compliance at disposal is often lacking; waste collection and disposal capacities remain too low to match the rapidly growing volume of waste generation; essentially all waste is landfilled and there is no waste separation, recycling or treatment (with some small exceptions); wild dumping is still spread and poses threats to soil, water and air contamination; pollution resulting from inadequate waste disposal has made a significant impact on numerous communities. The enabling environment for the sector is not well developed neither conducive to allow the sector to be upgraded in a sustainable manner: sector oversight is weak; economic incentives to stimulate diversion from landfilling and investment in recycling or treatment are not in place; separation at source does not take place; the EPR schemes are reportedly not working well; tariffs are below cost recovery; good quality data is not available which hampers planning; the general public awareness on the sector is extremely low; even institutional players have misconceptions about the sector, such as that more equipment will solve most of the problems or that the sector is hugely profitable.

Going forward, BiH has aspirations and has made a political commitment to join the EU. As in the case of other new EU member states, BiH will have to gradually meet steep environmental and sector objectives. The country is about to start developing more advanced initiatives related to separate collection and treatment, within the overall EU environmental framework. As part of a World Bank (WB) – SIDA partnership to assist BiH advance the waste sector, the present study aims to present a review of the EPR systems in the Federation, RS and Brcko district and to provide high-level recommendations based on lessons learned and experiences from the EU and specifically the new member states.

For the preparation of this study information was obtained during the two field visits and discussions with the competent entity authorities in charge with waste management, Environmental Protection Funds, producer responsibility organizations for packaging waste and waste electrical and electronic equipment, waste management companies, representatives of local authorities, NGOs . Furthermore use has been made of the analysis and recommendations prepared within the Solid Waste Management Sector Review and Recommendations on Sector Reform and Investments in the framework of SIDA financed projects, the State, Entities and Brcko District Waste Management Strategies, EU reports and regional studies.

Chapter 2 provides a short overview about the institutional responsibilities at the state level in the field of environmental protection. The Chapters 3 to 5 of the Study, present an analysis of the existing municipal waste management situation in the Federation, RS and Brcko district with a particular focus on packaging waste and WEEE management. The analysis describes the legal framework governing the EPR systems in place, including legal instruments used and definitions; the institutional set-up and interrelationships, covering the roles of various actors as well as their relationships (such as ministries, municipalities, cantons in the Federation, the producer responsibility organizations/compliance schemes, businesses/obliged persons, etc.); the distribution of the financing responsibilities for capital

investments, operations, community information/awareness, control and enforcement, etc.; existing documentation and reporting requirements and procedures for registration, reporting procedures, verification as well as monitoring and enforcement; annual recycling and recovery targets; available recycling industries.

Chapter 6 presents an overview of the experience and practices of EU countries in implementing extended producer responsibility for different material streams.

Based on the analysis of the existing situation, the issues that need to be addresses and the practices in other countries, Chapter 7 presents an analysis of the different alternatives that need to be considered for the further implementation in BiH. The pros and cons of the alternatives presented are analysed with regard to the possible implementation.

Chapter 8 presents a set of recommendations for changes/improvements, covering different legal, institutional, financial aspects of the EPR system.

The team is hopeful that this study will contribute to a better understanding of the prevailing conditions in BiH and required actions in the field of extended producer responsibility in order to avoid disappointments as experienced in other countries under similar circumstances and in order to advance the sector in line with the EU Acquis in an environmentally and financially sustainable manner.

2 INSTITUTIONAL SETUP AND NATIONAL LEVEL WITH REGARD TO ENVIRONMENTAL PROTECTION AND WASTE MANAGEMENT

In accordance with the General Peace Agreement for BiH, signed in Dayton on 21 November 1995, Bosnia and Herzegovina (BiH) consists of two entities: Federation of BiH (FBiH), Republika Srpska (RS). Based on an arbitral award passed on 5th March 1999, the Brcko District of BiH (BD) was formed as a third separate administrative unit under exclusive sovereignty of the State.

The central government at the level of BiH has limited powers with regard to environmental protection, as all governmental functions and authorities that are not expressly assigned to the institutions of BiH in the Constitution, are those of the entities. Therefore, the most significant policy-making activities in BiH, in terms of environmental protection, belong to the entities.

The overall institutional set up in BiH with regard to protection of environment is shown on **Error! Reference source not found.** presenting the various stakeholders at the various levels.

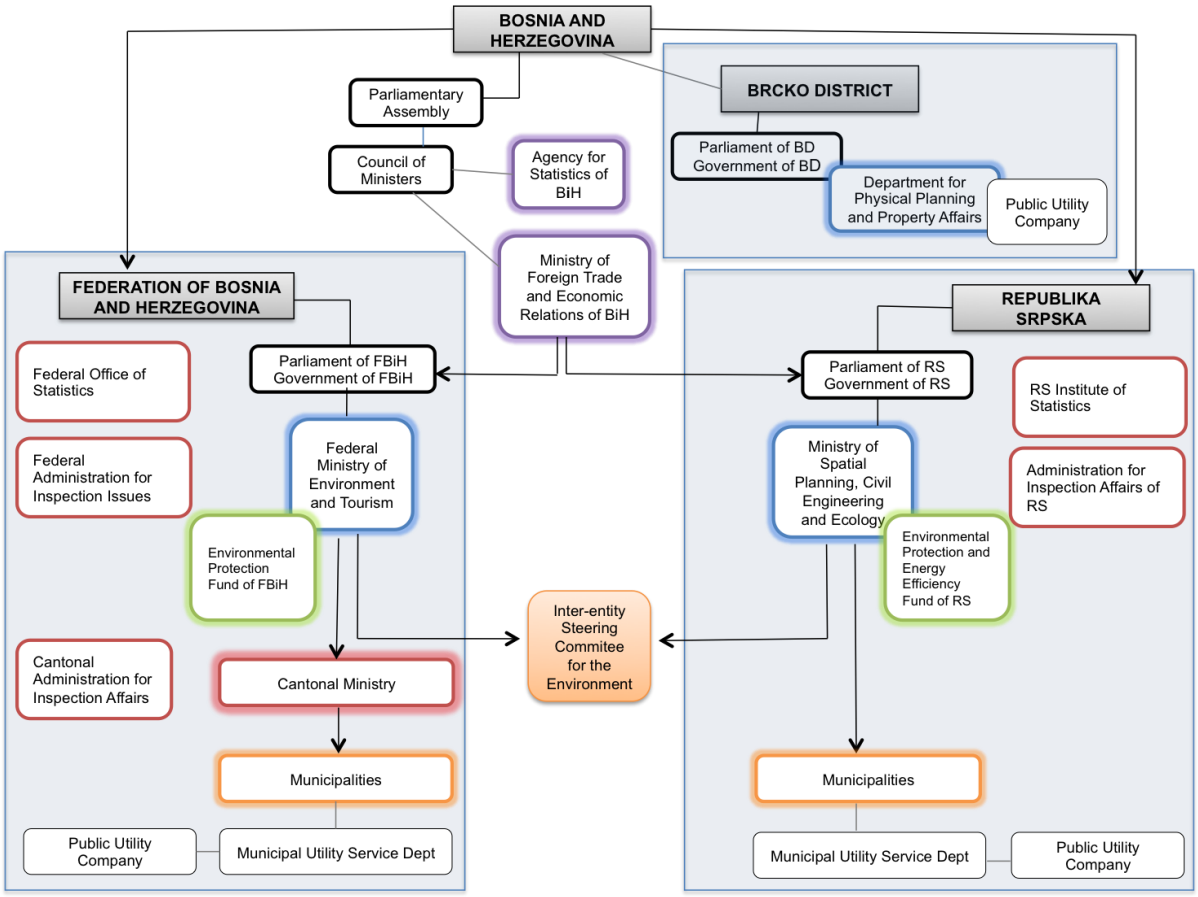

Figure 2-1: Institutional set up BiH

The **Ministry of Foreign Trade and Economic Relations** of BiH (MoFTER) is the national institution in charge of the ratification and access procedures of international conventions in the field of environmental protection, as well as for all operational matters within the BiH on this subject. Article 9 of the Law on Ministries and Other Bodies of BiH (Official Gazette BiH, no. 5/03, 42/03, 26/04, 42/04, 45/06, 88/07, 35/09, 59/09 and 103/09) provides the competencies of MoFTER as: definition of policies, basic principles, coordination of activities and harmonization of plans of entities' bodies, government and institutions in accordance with international obligations in the areas of agriculture, energetics, environmental protection, development and use of natural resources and tourism.

According to the Law on Statistics of BiH (Official Gazette of BiH, no. 26/04), development of statistical data of BiH includes all activities necessary for the preparation, collection, storing, processing, compilation, analysis and distribution of statistical data of BiH. The competent authority for organization, preparation and distribution of statistical information at state level is the **Agency for Statistics of BiH**, established in accordance with the provisions of the Law. The competent authorities of entities are entity Institutes for Statistics of FBiH and RS that are in charge for carrying these activities out in the entities. The Agency for Statistics of BiH collects the relevant data on municipal waste from entity Institutes for Statistics of FBiH and RS.

The **Inter-Entity Steering Committee for the Environment** is responsible for all environmental affairs where coordinated approach of both entities is needed. These include: international agreements and programs, participation in work of international organisations, coordination of adoption and implementation of legislation, coordination of environmental monitoring and implementation of environmental standards, coordination of monitoring and information system, etc. The Committee meets at least 6 times per year. Representatives of ministry for environment from both entities and BD participate in the work of the Committee.

The responsibilities of institutions in FBiH, RS and Brcko district are presented in the following chapters.

3 CURRENT STATUS OF EXTENDED PRODUCER RESPONSIBILITY IN THE FEDERATION OF BOSNIA AND HERZEGOVINA

3.1 Legal framework and policies

3.1.1 General

According to national census data the total population of FBiH in 2013 is 2,219,220 residents.

Figure 3-1: Administrative Organization of BiH According to the Dayton Peace Agreement

FB&H is administratively divided into 10 cantons that are further sub-divided into 79 municipalities. Each canton has its own government and adopts its own laws (which are in accordance with the legislation of FBiH). The average size of municipality is approximately 28,000 inhabitants ranging from 1,500 inhabitants (Trnovo) up to 118,550 inhabitants (Novi Grad Sarajevo). According to the OECD typology criteria[1], 61 out of 79 municipalities, are considered to be rural with average population density less than 150 capita per km^2.

The entity government for FBiH is responsible for developing and adopting its own environmental legislation, including legislation governing waste management. As such, there is no overarching waste legislation at the national level.

FBiH has adopted a series of laws governing environmental protection and its related secondary legislation like regulations, decrees and decisions.

[1] OECD Regional Typology, 2011 https://www.oecd.org/cfe/regional-policy/OECD_regional_typology_Nov2012.pdf

The framework legal requirements for waste management in FBiH are defined through the following main legal acts:

- Law on Waste Management (Official Gazette of FBiH, no. 33/03 and 71/09)
- Law on Fund for Environmental Protection (Official Gazette of FBiH, no. 33/03)

The legislation of FBiH corresponds to a large extend to the relevant EU directives in the sector.

The requirements of EU Waste Framework Directive[2] 2008/98/EC (WFD) are partly transposed through the Law on Waste Management (LWM), that establishes a general framework for all aspects of solid waste management in FBiH and in particular:

- Establishing common definitions (e.g. waste, waste generator, waste holder, etc.);
- Introducing an obligation for waste holders to take adequate measures for the management of their waste;
- Encouraging prevention, reuse, recycling and recovery in line with EU waste management hierarchy;
- Introducing the basic principles for the financing of waste management activities like polluter pays principle and extended producer responsibility;
- Setting up waste management planning requirements;
- Requirements and procedures for obtaining waste management permits for different categories of activities;
- Defining the responsibilities of the authorities and different stakeholders in waste management;
- Providing requirements towards the main functional elements of waste management system (temporary storage, collection, transportation, reuse, recycling and/or treatment, and disposal);
- Defining specific requirements for the management of hazardous waste;
- Provisions for trans boundary movements of waste; and
- Establishing requirements for the control of waste management activities.

The EU List of wastes is introduced through the Regulation on waste categories with lists (Official Gazette of FBiH, No. 9/05) and applies for the purposes of waste classification.

The main secondary legislation in FBiH related to packaging waste and waste electrical and electronic equipment (WEEE) consists of the following documents:

- Regulation on issuing permit for small-scale activities on waste management (Official Gazette of FBiH, No. 9/05)
- Regulation on waste categories with lists (Official Gazette of FBiH, No. 9/05)
- Regulation on management of packaging and packaging waste (Official Gazette of FBiH, No. 88/11, 28/13)
- Regulation on necessary conditions for transfer of obligations from producers and sellers on operators of systems for collection of waste (Official Gazette of FBiH, No. 9/05)
- Regulation on management of waste from electric and electronic equipment (Official Gazette of FBiH, No. 87/12 and 107/14)
- Regulation on form, contents and methodology for provision of information on important characteristics of products and packaging (Official Gazette of FBiH, No. 6/08)
- Regulation on transboundary movement of waste (Official Gazette of FBiH, No. 7/11)
- Decree on separate collection, packaging and labelling of waste (Official Gazette of FBiH, No. 38/06)

[2] Directive 2008/98/EC of the European Parliament and of the Council of 19.11.2008 on waste

- Decree on reporting obligations for operators and manufacturers of waste on conveying supervision, and monitoring and evidence in reference to conditions from waste management permit (Official Gazette of FBiH, No. 31/06)

As is the case with legislation, strategic documents pertaining to environmental protection and waste management are developed at entity level. The main strategic and planning documents related to waste management in FBiH are:

- Environmental Protection Strategy of FBiH for the period 2008-2018 which addresses waste management in its integral part, the Waste Management Strategy of FBiH (WMS FBiH)
- Federal Waste Management Plan 2012-2017 (FWMP).

In FBiH cantons develop their own strategic documents on waste management as part of their legal obligations arising from the Law on Waste Management.

The following sections present a short analysis of the main provisions in FBiH legislation and planning documents with regard the extended producer responsibility for packaging waste and WEEE.

3.1.2 Law on Waste Management (LWM)

Articles 16, 17 and 18 of LWM establish the extended producer responsibility principle and in particular:

- Requirements for the product design that stimulates prevention of waste, reuse and recovery
- Restrictions for the use of certain categories of materials and dangerous substances in products above certain limit values defined in the special regulations
- Responsibility for organizing take back and separate collection schemes and to ensure safe recovery and/or disposal of resulting waste
- Providing information to consumers about the important features of the product and packaging with regard to waste management

The producer and distributor can transfer their obligations to an operator[3] of waste collection system based on special agreement. The conditions for the transferring of obligations are defined in the specific secondary regulations.

Article 21, LWM provides a possibility the sellers of products and services to be obliged to take back the products or packaging at the end of their life cycle and transfer them to the producer or operator authorized to provide waste management services, if this is established by a special regulation.

In line with Article 12 of LWM, for waste management activities the operator needs to obtain a permit. Application for the waste management permit must contain the following information (Article 13 par. 1):

- information about the applicant and the operator (in case the two differ),
- types and quantities of waste, input and output,
- description of expected environmental impacts,
- proposed or existing capacity of plant or location,
- description of plant or location, including characteristics of the surrounding environment,
- proposed/existing treatment,

[3] The "operator of waste collection system" is equivalent to Producer Responsibility Organization (PRO)

- proposed/existing methods for pollution prevention and abatement,
- proposed/existing activities, monitoring and plan for supervision,
- proposed plan for decommissioning,
- financial and other guarantees from the applicant.

The operator of the waste collection system (system operator) shall obtain a permit based on application which, in addition to the requirements under Article 13 of LWM, contains the following (as defined in the Article 23 of LWM):

- organizational structure of the system,
- the geographical area from which the waste is collected;
- types of waste to be collected;
- schedule of collection,
- methods of treatment.

The permit must include the description and main elements of the collection system, type and amount of waste, the geographical area covered by this system, financial information, schedule of collection, documentation of waste flows.

The permit is issued for the period of 5 years and can be extended for the same period of time unless the terms under which the permit was issued are changed.

The Law provides same reasons for not granting the permit for the operator of collection system like for the usual waste collection, treatment and disposal activities (Article 13, par. 2). These include:

- the project is not in line with legal, environmental and health requirements;
- there are no (qualified) technical experts for plant or site management;
- measures for enhanced technical and professional development and training of staff are not envisaged;
- the necessary measures for preventing accidents and limiting their consequences have not been taken;
- no adequate financial or other guarantee has been provided,
- the project is not in accordance with the relevant waste management plan(s).

In addition to the above reasons, the permit shall not be issued unless it is provided:

- sufficient number and arrangement of collection points;
- fulfilment of the goals determined by a special regulation,
- environmentally sound waste management.

The costs of the established waste collection system are subject to the supervision of the competent market surveillance authority.

Selective collection, packaging and labelling of waste are regulated by special regulations[4].

[4] Decree on separate collection, packaging and labelling of waste (O.G. of FBiH, No. 38/06) prescribes measures for separate collection, identification, storage, packaging and labelling of waste prior to disposal, transport or transfer to another entity authorized for recovery or disposal, in a manner that protects human health and environment and encourages waste recovery and reuse.

The places for separate waste collection are considered part of the provided public services (Article 26) that has to be defined through cantonal regulations.

Such formulation is rather general and do not provide precise requirements for the type and scope of services.

The public services shall be performed by a waste management operator contracted through tender procedure. A tender can be submitted for all waste management activities or only for one or some of them.

Even though, LWM generally complies with the basic principles defined in the EU legislation, there are serious deficiencies and inconsistencies related to the following:

- The LWM formally allows the collection system to be established by an individual producer or distributor. Nevertheless, the responsibilities in case of individual compliance are not precisely defined.
- The requirements and procedures for obtaining of permit for operator of collection system (equivalent to PRO) are not well defined and allow for subjective interpretation. The cases and procedures for permit withdrawal, revision, renewal and prolongation are not defined at all.
- Because of the specific activity, the permit for PRO shall not be mixed with the permits for waste collection, treatment and disposal activities.
- The responsibilities of the operator of collection system and the cantonal and municipal administrations are not well established.
- The financial responsibilities to set up separate collection, treatment and disposal systems are not defined.
- The role of the Environmental Protection Fund in the development of separate collection and recycling system is not specified.
- There are no targets for recycling of household and similar waste at least for paper and cardboard, plastics, glass and metals[5].

3.1.3 Specific requirements for the management of packaging and packaging waste

The provisions of EU Directive on packaging and packaging waste are partly transposed into FBiH legislation through the LWM and the Regulation on packaging and packaging waste management (Official Gazette of FBiH, No. 88/11, 28/13) which transposes Article 3, Article 4.1, Article 6.1.a, Article 6.1.b, Article 6.1.c, Article 6.1.d, Article 6.1.e, Article 7.1, Article 11, Article 12.1 and 12.2, Article 13, Article 14 and Article 15 of the Directive. The Regulation on form, contents and methodology for provision of information on important characteristics of products and packaging (Official Gazette of FBiH, No. 6/08) transposes Article 3 (definition 1) and Article 8.3 on appropriate marking on packaging itself or on labels.

The Regulation on the management of packaging and packaging waste (RPPW) lays down rules for the management of packaging in the production, transport and use of packaging and the rules of procedure and other conditions of collection, re-use, recovery and disposal, in accordance with the priorities and the basic principles of the Law on Waste Management.

Re-usable (returnable) packaging is excluded from the scope of the regulation (Article 1). This is not a correct approach considering that the quantities of re-usable packaging are also taken into account when

[5] The targets for recycling of household and similar waste are defined in the EU Waste Framework Directive and differ from the targets for recycling and recovery of packaging waste.

defining the recycling and recovery targets. Nevertheless, data on re-usable packaging are included in the reporting templates for the obliged companies.

According to Article 12 of the RPPW, the producers, importers, fillers, packers, distributors and final suppliers must organize a special place for receiving, collecting, sorting and temporary storage of packaging waste that is taken or has emerged in their activities if the amount in a calendar year of such packaging waste exceeds:

- 80 tons of paper and cardboard
- 300 tons of glass
- 100 tons of metals or
- 30 tons of plastic

The defined threshold quantities are very low and such provision leads to misunderstanding. Separate collection in the premises of enterprises, commercial and administrative sites shall be obligatory even for significantly lower quantities and in any case, where a separate collection system for recyclable waste/packaging is established in the respective area.

The producers, importers, fillers, packers, distributors and suppliers are obliged to join the system of packaging waste management and for the achieving the prescribed objectives/targets (Article 13, par. 1 RPPW). The responsibility is diluted between several stakeholders in the supply chain. The sole responsibility for achievement of targets shall be designated to a single entity and usually this is the producer (packer, filler)/importer of the respective packed good. This is the first entity that introduces the packed good on the market. The responsibilities of manufacturers of packaging materials, distributors and other stakeholders shall be defined separately.

The Article 13, par. 2 allows the producers, importers, fillers, packers, distributors and suppliers to transfer their obligations directly to the operator of the packaging waste management system. In case of not transferring the obligations to the operator of the system, importers, fillers, packers, distributors and end - suppliers pay the prescribed fees to the Fund. Such provisions practically exclude the possibilities for the obliged companies to organize individually the take back of packaging waste and the achievement of the recycling and recovery objectives.

It shall be underlined that such provision does not give an equivalent consideration of the PRO and the Environmental Protection Fund. Giving the obliged companies a possibility to choose paying to PRO or the Fund is not advisable approach because their functioning is quite different:

- There are no clear responsibilities of the Fund with regard to achievement of the recycling and recovery targets
- There is no contract between the Fund and the obliged companies
- The activities of the Fund are not subject to a permit or other form of control equivalent to one applied towards the PRO
- The Fund has some control functions over the PRO

The payment of fees/product taxes for packaging placed on the market to the Fund shall not be considered as an alternative to comply with the obligations and shall continue to be implemented as punitive measure

The FBiH authorities shall decide either to establish an EPR scheme managed by the obliged industry or the entity authorities to take the responsibility for the achievement of targets through a tax system organized by the Fund. Both systems cannot function in parallel.

The subject is considered in more details in chapter 5.1.1.

The Article 15 of RPPW defines the system operator (PRO) as "*legal entity, authorized by the Ministry, which deals with the activities of packaging and packaging waste*".

The organization has the primary objective of meeting the legal requirements prescribed by RPPW.

The Regulation imposes a requirement for non-for-profit operation of PRO and its entire profit (if any) must be invested in infrastructure for packaging waste management. It also contains specific provisions limiting the potential founders of PRO to legal entities that conduct their business activities by putting into circulation packaging or packaged products on the state territory. Fees to be determined by the operator of the system should be equal for the founders and for the clients of the operator. The operator of the system cannot possess its own infrastructure for waste management.

Article 17 of RPPW defines additional supplementary documents required for the obtaining of permit by the PRO. These are specific for packaging waste and include:

- contracts with at least 30 entities which put on the market at least 30,000 tonnes of packaging annually
- preliminary contracts with authorized waste collectors from all cantons and processors for all types of packaging materials (plastic, paper, cardboard, metal, glass, wood, multilayer materials);
- packaging waste management plan;
- Statute of the system operator;
- proof of ownership of business premises or lease of business premises;
- certified copies of diplomas of high qualifications for staff;
- proof of registration of employees in the Federal Pension and Disability Insurance Institute and Federal Health Insurance and Reinsurance Institute;
- other evidences, upon request.

The Waste Management Plan prepared by the PRO is integral part of the application for the permit and shall contain the following information:

- types of packaging managed,
- the manner and frequency of taking over the packaging waste from the end-user;
- the type and capacity of equipment, plant and equipment for the collection, temporary storage, sorting and other activities to ensure reuse, refurbishment and disposal of packaging waste;
- the total envisaged mass of packaging waste to be collected during the year and the weight of packaging materials that need to be recycled in accordance with national goals;
- methods and manufacturers that provide reuse, recovery and disposal of collected packaging waste;
- the amount envisaged processed packaging waste, and of the quantity of certain recyclable materials according to national targets.

The permit of PRO issued by the Ministry is limited to a period of five years. The license can be extended for the same period of time unless the conditions under which the license was issued are changed.

The permit shall contain information about the type of packaging waste to be collected, the amount of packaging waste which must be recovered and recycled, and the quantity of raw materials in packaging waste intended for recycling, expressed as a percentage.

The license can be annulled with a Ministerial decision in case that Organization (Article 18):

- does not manage packaging waste in accordance with regulations.

- does not submit an annual report on packaging and packaging waste in accordance with this Regulation.
- does not meet the targets.
- fails to submit evidence of the accuracy of the information specified in the report.
- if the number of entities that have signed agreements with the Organization falls below 30 or if the annual quantity of packaging managed by the Organization falls below 30,000 tonnes, or if any of the conditions prescribed under Article 17 under which the license was issued is changed.

The list of required information necessary for the obtaining of permit and the content of the permit shall be revised and if possible, more precise and detailed requirements and formulations shall be provided. The conditions for permit extension, revision and withdrawal should be revised too.

The PRO is obliged to prepare an Annual report by 31 March of the following year (Article 21). The report shall be submitted to both the Ministry and the Fund. The report shall be prepared in the form defined in Annex 2 to the RPPW and contains the following information.

- the quantity of packaging put on the market by the members of PRO.the total amount of packaging materials, collectors downloaded to storage and / or from end users.
- the quantity and type of the restored, recycled or disposed packaging waste, for each method of exploitation or special disposal.

Reporting obligations also apply to entities, which did not achieve their obligation through the operator of the system, to make independently report to the Federal Ministry and the Fund.

Based on the reports submitted the Fund adopts a decision on fees payment and maintains a register of all obliged payers.

All obliged payers pay the so –called "general fee" in the amount of 0.002 BAM/kg of packaging to the Fund for administrative costs of implementation of PPWR. The operator of the system pays the "general fee" for its members.

According to Article 23, the producers of packaging materials, importers, fillers, packers, distributors, final suppliers, placing packed good on the market in FBiH are obliged to pay compensation/fee[6]:

- The fee is determined according to the type, quantity, composition and purpose of the packaging, the material from which the packaging was made, as well as in relation to the national goals (recycling and recovery targets).
- The fees are paid to the Environmental Protection Fund.
- The fees are specifically used for the management of packaging waste.
- Environmental Fund of FBiH plans purposeful use of funds annually, coordinated with the Federal Ministry of Environment and Tourism.
- Exemption from paying fees is regulated by a decision of the Environmental Protection Fund issued to the system operator and is realized to fulfill the objectives of packaging waste management (Article 24, RPPW).

[6] Initially the fees were calculated as a penalty for not achievement of general and material specific recovery and recycling targets. The fees were calculated by multiplying coefficients to the difference between the target quantities and the actually recovered/recycled quantities. Similar fee calculation mechanism presently applies in RS.
Following the amendments in the Regulation of packaging and packaging waste management from the April 5th, 2013, the fee calculation mechanism was changed.

The mechanism for the calculation of fees due by the companies who do not pose a signed contract with system operator is not very clear. Assuming that such companies have to pay a fee for the whole amount of packaging placed on the market the maximum fees per tonne of different packaging materials is obtained by multiplying the fee coefficient for the respective material to the general recycling and recovery target applied for the respective year.

Table 3-1: Estimated fees per tonne of packaging material placed on market in FBiH, 2016

Material	Fee coefficient (Annex III, RPPW) BAM/kg	Recycling and recovery targets (2016 – 2021)	Maximum fee recalculated per tonne of different material BAM/tonne
Glass	0,40	35%	140
Metal	0,30	35%	105
Paper and paperboard	0,40	35%	140
Plastic	0,60	35%	210
Wood	0,25	35%	87.50
Multilayer and other materials	0,60	35%	210

Regarding fee calculation and payment mechanism, the following observations can be done:

- The procedures for the calculation and the payment of fees are not well defined in the Regulation.
- There is no requirement or guidance how the packaging quantities shall be measured and recorded by the obliged companies
- An annual payment of the fee is difficult to be enforced compared to monthly payments.
- There is no formal requirement the fees to be calculated in the costs of goods sold.
- It is not clear on what basis the size of the fee coefficients for the different packaging materials were calculated and defined. The unit costs for the separate collection and sorting of paper and cardboard packaging are expected to be much lower than for the plastics and other materials.
- The differences in maximum estimates of the fees per tonne for the different materials are not significant and do not correspond to the different separate collection costs for the different materials (i.e. cross subsidies between the different packaging materials shall be expected)
-

Despite that, there is a formal requirement the funds generated by the fees on packaging to be spend for packaging waste management, there are no clear rules how the spending shall be organized:

- Financing of separate collection equipment and infrastructure like containers and collection vehicles
- Financing the operating costs for separate collection and sorting
- Payments per tonne of separately collected packaging waste
- Cost sharing in case that same facilities are used for collection of non-packaging materials (e.g. printing paper)
- How to guarantee that the funds spend are not subsidizing other municipal activities
- Tendering of services
- Financing of recycling infrastructure

According to Article 26, the control functions are delegated to environmental and market inspectors of the Federal Administration for Inspection Issues.

The Government of FBiH established, by its own decision, a Coordinating Body for monitoring of the implementation of RPPW. One representative of each of the following institutions participate in the work of the Coordinating Body[7]:

- Environmental Fund of FBiH
- Federal Administration for Inspection Issues
- System operators holding valid permits issued by the Federal Ministry of Environment and Tourism
- Federal Ministry of Environment and Tourism.

The inter-entity environmental body monitors the state of packaging waste management and coordinates activities between the Entities and the District of Brčko and consolidates reports on the quantities of packaging placed on the market of Bosnia and Herzegovina (Article 22, RPPW).

In addition to the above comments, the following main deficiencies in the packaging waste specific legislation are identified:

- There are no provisions about the cantonal or municipal administrations and what are their obligations with regard to packaging waste management.
- There is no precise division of responsibilities for organizing separate collection and recycling in case that more than one PRO operate on the market
- Practically, no penalty provisions exist in the regulation as the general reference to the Articles 52 and 53 of the LWM makes the offences unclear, difficult prove and enforce.
- The format of the Annual Report for packaging and packaging waste provided in Annex II was improved considerably following the amendment of the PPWR. Despite of that, its recommendable the template to contain additional information about:
  - Type of the packaging: primary, secondary, transport
  - The specific materials – for example PET, LDPE, PP, etc. and not general categories (plastics)
  - The beverage cartons shall be defined as separate category and not included in the general category of composite packaging
- The annual report is not audited by an independent auditor.
- The PRO shall be legally responsible for the providing information on behalf of the obliged companies about the quantities and type of packaging placed on the market.

3.1.4 Specific requirements for the management of WEEE

Directive No. 2002/96/EC of the European Parliament and of the Council of 27.01.2003 "on waste electrical and electronic equipment (WEEE)", as amended by Directive No. 2003/108/EC, 2008/34/EC and 2008/112/EC is partly transposed through the Law on Waste Management (Official Gazette of FBiH, No. 33/03, 72/09) and Regulation on WEEE management (Official Gazette of FBiH, No. 87/12 and 107/14).

The WEEE regulation contains precise and detailed provisions about:

- classes and subclasses of equipment

[7] Regulation and Decision on nominating Coordination Body for Monitoring of Implementation of Regulation on Management of Packaging and Packaging Waste (Official Gazette of FBiH no 45/13)

- providing information to end users about the management of WEEE, including advantages of its reuse and recycling and the applied collection methods
- informing all distributors in the distribution chain, and in particular the seller about their obligation to take free of charge WEEE from end users.
- minimum targets for collection of WEEE
- minimum targets for recovery, reuse and recycling per category of WEEE, expressed as a percentage from the quantity of waste collected.
- responsibilities of the PRO (system operator)
- documentation and reporting requirements for the manufactures and importers of equipment and PRO
- procedures for issuing of permit for the activities of PRO
- reimbursement of collection costs to PUCs
- requirements for the collection, transportation, treatment and processing of WEEE
- payment of fees for the equipment placed on the market in FBiH
- control and monitoring

Minimum collection targets for WEEE are defined as a percentage of the quantity of equipment placed on the market in FBiH during the calendar year. Such approach is different from the practice in other countries where collection targets are defined per capita or based on the average quantity of equipment for several previous years.

The collection targets apply for the total quantity of WEEE and no specific targets for the different equipment categories are established. In this situation the PRO will not be interested to put significant efforts and resources to collect certain hazardous waste equipment categories that are difficult to collected and require high processing, recovery or disposal costs.

WEEE Producer Responsibility Organization (system operator)

- The PRO is a legal entity authorized by the ministry to deal with WEEE activities.
- The PRO shall have the primary goal of fulfilling the legal requirements prescribed by WEEE Regulation.
- Owners of the system operator must be manufacturers or importers who place on the market the equipment in the territory of BiH and who have transferred the obligation to manage and dispose of waste equipment to the system operator. The minimum quantity of electrical and electronic appliances placed on the market in FBiH by the owners of PRO shall exceed 5,000 tons.
- The operating capital of the system operator must be at least 750,000 KM in cash.
- The PRO shall perform its business activities on non-for-profit the principle, which is clearly defined in the company statute.

The PRO is obliged at its own expense to:

- acquire waste equipment from distributors and utility companies, regularly and as often as necessary,
- organize the storage and transport of WEEE taken over from the end user, distributors and utility companies to an appropriate waste treatment facility that has been,
- to ensure pre-treatment of WEEE plant prior to its final processing or disposal and
- ensure its further processing or disposal in accordance with the requirements of the WEEE Regulation.

The PUCs must transfer the WEEE collected from the household to collector authorized by the PRO without requiring the payment of the possible value of the constituent parts of the material or substances in WEEE that could be reused or recycled. The PRO must compensate the PUC for the following waste

management costs for installing and maintaining facilities and equipment for temporary storage of WEEE and the costs for initial preparation of WEEE such as stacking, loading, measuring and similar actions.

The PRO must ensures that the re-use of the whole equipment takes precedence over its processing, the processing of the recovered waste equipment takes precedence over the disposal, and in the processing of waste equipment, the re-use of the components of the waste equipment and the recycling of materials takes precedence over other processing methods.

PRO permit

A permit for the management of waste equipment shall be issued by the Ministry to the system operator on the basis of a application submitted by PRO.

The PRO must, with the application for the issuing of a permit, enclose documentation proving its ability to establish WEEE management system. Within the same documentation, the entity is required to present a representative number of entities that will be included in the system.

The waste management plan provided with the application for obtaining a permit should contain information on:

- type of product by class or subclasses of equipment for which the acquisition, collection and processing is provided,
- the envisaged manner and scope of taking over of WEEE from end users and collectors,
- type and capacity of equipment for temporary storage of WEEE in collectors,
- the types and capacities of the equipment for temporary storage of WEEE in the main storages,
- collectors and / or carriers of waste equipment from end consumers, distributors, utility companies and warehouses to processing plants,
- the types and capacities of the equipment in the waste equipment processing plant, the location and manner of management of that plant and the level of processing of waste equipment before handing over to further processing or disposal,
- the anticipated amount of annual recovered waste equipment, expressed in kg (tonnes), on the basis of the annual quantity of equipment placed on the market,
- the anticipated amount of annual WEEE collected from the households,
- the envisaged procedures and perpetrators of further processing or disposal of waste equipment, including the reuse and recycling of its constituent parts, embedded materials and hazardous materials, and
- activities for informing end users and distributors as well as developing public awareness on the collection procedures and environmental impacts.

Model for calculation of compensation of costs for collection of WEEE, preliminary contracts for storage, collection, treatment, dismantling, recovery and disposal and communication plan shall be provided.

The waste management plan shall demonstrate that the collected WEEE will be processed in treatment plants complying with the technical requirements set out in Regulation.

The permit of PRO is issued for a period of five years and can be extended for the same period of time if the conditions under which the permit is issued are not changed.

The permit shall in particular include: the type of waste equipment to be collected, the amount of waste equipment to be collected and used, and the manner of reporting.

Documentation and reporting

The system operator is responsible to submit quarterly reports to the Ministry and the Fund on all producers and importers included in the scheme. The aim of this report is to improve efficiency when it comes to the including new members in the scheme as well as monitoring of all recorded importers of WEEE in BiH.

Not later than March 31 of the current year, the system operator shall submit in electronic and written form to the Ministry and the Fund a report on the management of WEEE for the previous calendar year. The template for the report is provided in the Annex 6 to the Regulation. The template for the report is prepared by the Fund.

The annual report contains information about:

- list of manufacturers and importers who have transferred responsibility to the system operator,
- the total quantity of equipment placed on the market, divided by classes and by the obliged companies,
- the total quantity of WEEE by class, or subclasses and by certain types of products expressed in kg (tonnes), taken from end users, distributors and utility companies,
- the quantity expressed in kg and the part of the WEEE that was reused or recycled,
- the quantity expressed in kg and part of the WEEE that was otherwise processed, separately according to the processing methods,
- the amount and the part of the WEEE by class, or subclasses that has been disposed, and
- the quantity expressed in kg and parts of removed components, embedded materials and certain hazardous materials.
- a report on performed communication and public awareness activities.
- proof on method used to reuse, process, treat and dispose WEEE and its components, including their amounts recorded in line with requirements set in Article 9 item 10,
- a report on costs for management of collected WEEE,
- a report on investments made in the WEEE management system.

On the basis of the report, the Fund shall keep records of electrical and electronic waste.

There is no formal requirement the report of the PRO to be audited by an certified auditor.

There is no formal requirement the PRO to submit a financial report.

There is no formal requirement for a registration of manufacturers and importers of electrical and electronic equipment and that only registered companies can place equipment on the market in FBiH.

Supervision

Administrative supervision of the application of this Rulebook shall be carried out by the environmental inspection bodies.

The Ministry in charge of trade through market inspectors shall supervise the application of the provisions of the regulations regarding the placing of equipment on the market. Data is updated quarterly at the request of the Fund or the system operator once a month.

Technical requirements for the WEEE treatment plants are defined in the Annex 4 to the Regulation.

Economic instruments

All importers and manufacturers of electrical and electronic equipment pay a general fee in the amount of 0,02 KM per kilogram of electrical and electronic equipment placed on the market of the FBiH to the Environmental Protection Fund for the administrative costs of implementing this WEEE regulation.

The general fee is paid for half year period.

The manufacturer and importer shall be obliged to pay compensation when placing the equipment for the first time on the BiH market.

The manufacturer and importer shall send the Federal Ministry and the Fund a fee and a report on the quantity, weight and type of equipment put on the market on the form "calculation of compensation". The reports are covering six months (half year) period.

It can be assumed that the obligation for submission the reports and payment of general fee can be transferred to the PRO.

A manufacturer and importer who has not transferred their obligations to a PRO shall be obliged, along with the general fee, to pay a fee for the management of WEEE to the Fund. Fees are specifically spent for the management of electrical and electronic waste. The amount of compensation for waste equipment management is the multiplication of the quantity[8] of equipment placed on the market of the territory of the country and the compensation coefficient for the specific category of equipment. The fee for the management of WEEE is different for the different equipment categories and varies 0.3 BAM/kg for the large domestic appliances to 4.0 BAM/kg for the TVs and monitors.

If the PRO has not fulfilled the objectives for the year of reporting, the Fund shall determine by its decision to pay the waste management fee for unfulfilled targets under paragraph 5 and 6 of this Article.

3.1.5 Federal Waste Management Strategy

The Federal Waste Management Strategy (FWMS) for the period 2008 - 2018 is an integral part of the Federal Environmental Protection Strategy, developed in line with provisions of the Federal Law on Environmental Protection.

The Strategy defines the main principles and strategic goals (SG) for the waste management in FBiH with particular focus on:

- Adoption of a regional approach to MSWM in which municipal authorities cooperate and combine to form inter-municipal institutional entities and geographical regions through which the regional approach is to be adopted for the provision of all or part of the waste management requirements of the region.
- Reduction of risks to the environment and human health and establishment of priority infrastructure for integrated waste management (SG 7.1.), with operational goals indicating closure of municipal landfills and gradual transfer to regional disposal concept;
- Reduction of the amount of waste for final disposal with more efficient resource use (SG 7.2.);
- Ensuring the implementation of the system through legal, institutional and economic framework (SG 7.3.);
- Ensuring systematic monitoring of parameters for assessment of the state of the environment (SG 7.4.).

The strategic goals have their own specific operational goals (OG) as explicit and measurable changes that will be realized during the implementation of measures from the Strategy and contribute to achieving the objective of the overarching goal and strategic goals.

SG 7.1 defines quantitative targets that refer to organized municipal waste collection, creating of conditions for sanitary landfilling and closure of existing non compliant municipal landfills while the

[8] Initially the fee was defined per unit of equipment

SG 7.2 defines quantitative targets that refer to the amount of separated municipal waste, reduction of biodegradable waste disposed and recycling and reusing of special waste. The goals for the separate collection and recycling of packaging waste are presented below (Table 3-2).

Table 3-2: Goals for separate waste collection and recycling

Operational goal	2011	2014	2018
Establish separate waste collection system in all municipalities in FBiH (% of the total number of municipalities)	30	60	95
Collect and recycle waste packaging (% of total waste)	8	20	30
Paper and cardboard	35	45	55
Glass	4	10	40
Metal	55	60	65
Plastic	3	6	15
Establish fully operational waste management regional centres in all regions (% of the total planned number)	-	-	100

SG 7.2 also sets quantitative targets that refer to increase in recycling and reuse for special waste categories like end-of-life vehicles, spent batteries, WEEE, used tyres. (Table 3-3).

Table 3-3: Goals for increase in recycling and reuse for special waste categories

Operational goal	2011	2014	2018
Increase the overall percentage of waste recycled or recovered operations (%)			
WEEE	20	30	70

Generally, it can be concluded that none of the above targets has been realized. Lessons learned should be reflected in future SWMS and SWMP's by introducing more realistic targets based on impact on costs and thus tariffs.

The FWMS also recognizes the need for improvements in the legal, institutional and economic framework by adoption of necessary secondary legislation, establishment of waste management information system and setting of special charges for certain types of waste.

3.1.6 Federal Waste Management Plan 2012 -2017

The development of the Federal Waste Management Plan (FWMP) is prescribed by Article 6 of the Law on Waste Management. The FWMP is the implementing document of the FWMS and provides guidance for the management of different types of waste in FBiH, whose main goal is the establishment of an integrated waste management system.

In accordance with the FWMS the integrated waste management system is in line with the regional concept developed for several municipalities that partner in a region (for waste collection, separation and recycling). The Law on Waste management leaves the possibility of constructing inter-municipal (regional) landfills, on which the final decision lies with the cantonal selection of desired concept, materialized through cantonal waste management plans.

Development of cantonal Waste Management Plan is a legal obligation of the cantons, an instrument on which all relevant authorities in municipalities should agree on and based on which activities and investments in the waste management sector will be planned. At present five cantons have adopted their WMPs.

3.1.7 Legislation at Cantonal level

Article 11 of the Federal Law on Waste Management (Official Gazette of FBiH, no. 33/03 and 72/09) states that cantonal ministries are in charge of the management of all types of waste, and determining appropriate sites for the development of waste management infrastructure. Cantonal ministries are also responsible for the development of cantonal waste management strategies and plans, drafting laws and regulations for the cantonal jurisdiction, issuing permits for waste management activities and environmental permits for waste management plants and facilities below the threshold stipulated in the Regulation on Plants and Facilities. Furthermore, Article 25 defines that cantonal ministries are responsible for drafting legislation on collection and treatment of MSW and forming and operation of municipal utility companies and the obligation of municipalities in the provision of utility services.

At municipal level, management of MSW is regulated through Decisions on communal order which define the rights and obligations of inhabitants, municipal utilities and other actors involved in maintenance of communal hygiene, public order, maintaining of public green areas and public traffic lanes, public lighting, other municipal facilities and collection and disposal of MSW.

3.2 Institutional framework

FBiH is composed of ten cantons whose jurisdiction is defined by the Federation's Constitution. Each canton has a cantonal government which adopts its own laws (in line with Federal legislation).

Under Article 11 of the Law on Waste Management (O.G. of FB&H, No. 33/03, 72/09), the Federal Ministry of Environment and Tourism (FMET) is in charge of activities relating to the transboundary movement of waste, all waste management activities (including treatment facilities) which are located, or undertaken, in two or more of the Federation's cantons. FMET is responsible for the development of waste management strategies, plans, laws and regulations which cover FBiH. In addition, they also issue environmental permits for waste management plants and other facilities which operate at levels above the thresholds stipulated in the Regulation on Plants and Facilities (O.G. of FBiH, no.19/04). These regulations require that an environmental impact assessment be undertaken before a facility is constructed and an environmental permit can be issued.

Article 11 of the Law also stipulates that cantonal ministries are in charge of the management of all types of waste, and determining appropriate sites for the development of waste management infrastructure. Cantonal ministries are also responsible for the development of cantonal waste management strategies and plans, laws and regulations from the cantonal jurisdiction, issuing permits for waste management activities and environmental permits for (waste management) plants and facilities below the threshold stipulated in the Regulation on Plants and Facilities (O.G. of FBiH, no.19/04).

In certain aspects, competency is shared between FMET and competent cantonal authorities. For example, cantonal authorities are responsible for the issuance of the majority of waste management permits, other than for those that are issued for facilities and activities which have inter-cantonal characteristics.

In addition to the provisions of the Law on Waste Management, in FBiH, principles of local self-government are regulated by the Law on Local Self-Government (O.G. of FBiH, No 49/06). Each canton adopts its own Law on Utility Services which determines utility services, principles, performance and financing, and other issues of importance for the successful performance of utility

services in cantons. Based on these laws, cantons, towns, and municipalities are obliged to provide the required utility services (including collection, treatment and disposal of municipal waste). Cantonal laws on utility services also define which utility services are regulated in detail by the municipal regulations. Municipalities regulate the performance of individual utility services by adopting their own regulations (municipal Decisions on utility services which regulate utility order and maintenance of utility services). These cover collection and treatment / disposal of municipal waste).

The competent authorities for utility services are defined within the laws (either the cantonal government, or municipalities and cities), as well as entities that can perform utility services (including for municipal waste management services).

At the municipal level in FBiH, the system of public administration is often directly involved in solid waste management. Municipalities are responsible for the development of municipal waste management plans and the organisation of waste collection and disposal activities. Waste management services are typically provided by public utility companies (which are fully or partly state-owned), or, to a lesser extent, undertaken by private companies contracted by municipalities. Such utility companies are financially responsible for their operations – that is, they collect fees from households and pay access fees to the landfill operators if they are part of a regional landfill scheme. The municipalities in Sarajevo Canton are exceptions, as the Cantonal Public Utility Company of Sarajevo collects waste while also being responsible for managing landfill operations.

As noted above, the legislation on utility services is adopted at the cantonal level, given that the public utility services are in the jurisdiction of cantons and municipalities. Local governments (municipal governments) are obliged to prepare and propose a development program, adopt and implement local waste management plans, regulate and ensure the provision of communal services and their development, organize management of municipal waste and non-hazardous waste in their territory, provide funding for duties within their competence, and develop and manage tenders and contracts for the utilities.

Municipal departments for urban planning and utility affairs are responsible for waste management planning. Through these departments, municipalities engage utility companies to perform certain tasks in waste management at the municipal level (municipality may establish a public utility company or these tasks may be contracted out to private companies).

3.2.1 Federal level

The key institutional actors include the Federal Ministry of Environment and Tourism (FMET), Fund for Environmental Protection (FEP) of FBiH and Federal Administration for Inspection Issues (FAII), Federal Institute for Statistics and cantonal environmental ministries and municipalities. In FBiH, each canton is responsible for adopting its own Law on Utility Services. These laws determine the principles, performance and financing of utility services, and set out other issues of importance for the successful performance of utility services within each canton. Based on these laws, cantons, towns, and municipalities are obliged to provide the required utility services (including collection, treatment and disposal of municipal waste). Municipalities regulate the performance of individual utility services by adopting their own regulations. Municipal Decisions on Utility Services are intended to regulate and ensure the continued maintenance of utility services. These services cover the collection and treatment / disposal of municipal waste.

The brief description of the roles and responsibilities of FMET, municipalities and other key institutions are given below.

Federal Ministry of Environment and Tourism (FMET)

Activities pertaining to waste management are primarily carried out within the Sector for Environmental Protection, Sector for Environmental Permits, and Sector for Project Implementation. In terms of waste management, the key unit is the Sector for Environmental Protection. Only one employee is dealing with waste management in FMET.

FMET is responsible for the development of waste management strategies, plans, laws and regulations, which cover FBiH. In addition, they also issue environmental permits for waste management plants and other facilities which operate at levels above the thresholds stipulated in the Regulation on Plants and Facilities (Official Gazette of FBiH, no.19/04). These regulations require that an environmental impact assessment be undertaken before a facility is constructed and an environmental permit can be issued.

Fund for Environmental Protection of FBiH

The Fund for Environmental Protection of FBiH was founded 2003 by the Law on Fund for Environmental Protection of FBiH (Official Gazette of FBiH, No. 33/03) for the purpose of collection and distribution of funds for environmental protection. It is a non-profit public institution. The Fund collects and distributes payments for environmental protection on the territory of FBiH. It instigates and finances (after tendering procedures) the preparation, implementation, and development of programmes, projects and similar activities. It does so in the fields of conservation, sustainable environmental use, protection and improvement of the state of the environment, and use of renewable energy sources.

Pursuant to the Law on Amendments to the Law on Waste Management, which entered into force in December 2017, the Fund is responsible for planning, establishing and maintaining a waste management information system.

Administrative supervision, supervision over the legality of work and by-laws of the Fund is performed by the Federal Ministry of Environment and Tourism.

Control over the implementation of the Law on Fund for Environmental Protection of FBiH and other regulations based on this law is performed by the Federal Administration for Inspection Issues within the organizational unit Inspectorate of Urban – Environmental Inspection.

Control over the calculation and payment of fees, in accordance with the Law on Fund for Environmental Protection of FBiH, is performed by Federal Ministry of Finance, Tax Administration of the Federation of Bosnia and Herzegovina.

The resources of the Fund for Environmental Protection of FBiH originate from:

- Levies on polluters;
- Levies on natural resources users;
- A levy on each motor vehicle registration;
- Proceeds arising from international bilateral and multilateral cooperation and in-country cooperation on mutual programs, projects and similar activities in the field of environmental protection;
- Bank loans;
- Funds from loans by other legal entities and monetary institutions;
- Donor funds and other forms of support;
- Fund operations (service fees, repayment of principal interest etc.);
- Budget of FBiH
- Penalties, and
- Other sources of funding defined by a special law, other regulations or contracts.

In relation to the waste sector, the Fund currently collects the following fees:

The fee for managing packaging and packaging waste, which is based on the amount of packaging (of any type) of a product that is being marketed for the first time in FBiH. The criteria for the calculation of the fees as prescribed in the Regulation on Management of Packaging and Packaging Waste (Official Gazette of FBiH, no. 88/11 and 28/13) for those obliged companies that have not joined the organized system through an authorized operator (specified in Annex III of the Regulation). This fee is called "fee for unfulfilled goals" and is prescribed in Article 23 of the aforementioned Regulation. As of 2014 the Fund has begun collecting of the so-called "general fee" paid to the Fund by all obliged payers, regardless of being part of the organized system or not (as prescribed by the amendment of the Regulation, brought in 2013). This general fee serves the Fund to cover its administrative costs of monitoring the entire system of packaging and packaging waste, processing reports of all obliged payers and all operators, and establishing and managing databases, i.e. the Register of obliged payers and amounts of material and waste. The general fee amounts to 0.002 BAM per 1 kg of packaging and is calculated based on annual Report on Quantities and Types of Packaging which is submitted to the Fund by authorized operators and obliged payers that have not joined the organized system. The Report contains data on the total quantity of packaging the obliged payer holds, which includes: quantity of imported packaging, quantity of exported packaging, quantity of packaging in which goods are packaged and placed on BiH market (RS, FBiH, BD), and the amount of stored goods packed in packaging. For obliged payers that have joined the organized system through an authorized operator, the general fee is paid to the Fund by the authorized operator once per year based on its Annual report to the Fund for all its users.

The fee paid by environmental polluters according to the Regulation on Fees for Plastic Bags (Official Gazette of FBiH, no. 9/14) is paid by all traders (retail shops, stores, supermarkets, bakeries, newsstands, pharmacies, grocery stores, etc.) registered in FBiH which consume plastic bags for their own needs or put them into trade. The revenue from the fees on plastic bags is divided between the 10 cantons and the Fund in a ratio of 70 % to the cantons and 30% to the Fund.

The general fee for managing waste from electronic and electrical equipment is paid by all manufacturers and importers of EEE when placing products on the market in FBiH for the first time regardless whether they have joined the organized system through an authorized operator or not. The purpose of this fee is to cover the administration costs for implementation of this Regulation. Additionally, the Fund collects fees for management of WEEE from those producers and importers who have not transferred their obligations to authorized system operators. The categories of equipment are grouped into classes and sub-classes and the unit rate fee is based on the type of equipment. The method of calculation and payment are prescribed in the Regulation on Management of Waste from Electric and Electronic Equipment (Official Gazette of FBiH, no. 87/12 and 107/14).

Inspection supervision over the application of these regulations is conducted by environmental inspectors of and market inspectors of the FAII. FAII controls both the obliged payers and system operators.

For the purpose of coordinating the implementation of these regulations, the Government of FBiH issued the following:

- Decision and Resolution on the nomination of Coordinating Body for overseeing the implementation of the Regulation on Management of Packaging and Packaging Waste (Official Gazette of FBiH, no. 45/13)
- Decision and Resolution on the nomination of Coordinating Body for overseeing the implementation of the Regulation on Management of Waste from Electric and Electronic Equipment (Official Gazette of FBiH, no. 79/15)

The members of the Coordinating Bodies are made up of one representative of the following institutions:

- Federal Ministry of Environment and Tourism (FMET)
- Fund for Environmental Protection of FBiH (FEP of FBiH)
- Federal Administration for Inspection Issues (FAII)
- system operators holding valid permit from the FMET.

The system operators for WEEE are not full members of the Coordinating Bodies but associated members. This is not the case for the system operators for packaging waste.

The specific tasks of the Coordination Bodies include:

- Review of periodic and annual reports of authorized system operators;
- Review of periodic and annual reports of the FAII in relation to inspection supervision over the application of the regulations WEEE and packaging and packaging waste;
- Review of the annual plan of planned expenditure of funds of FEP of FBiH which needs to be coordinated with FMET;
- Establishment of a unified registration system on packaging and packaging waste and WEEE as part of the Registry of plants and pollution of FMET;
- Submission of annual reports and the results of the implementation of the regulations on WEEE and packaging and packaging waste to the Government of FBiH.

Federal Administration for Inspection Issues (FAII)

The FAII was set up in accordance with the Law on Inspections in FBiH (Official Gazette of FBiH, no. 69/05) as an independent federal administrative body. It started operating on 01 January 2007, headquartered in Sarajevo. The FAII has detached offices for internal control in Mostar, Tuzla and Zenica. It has a total of 10 inspectorates, internal control sector and sector of border inspection. It reports annually on its operations to the Government of FBiH, in line with Regulation on the planning of work and reporting on the work of the Federal Government, Federal ministries and institutions (Official Gazette of FBiH, no 89/14). FAII carries out inspection tasks falling in the scope of Federal Inspectorates organized under it; enacts implementing regulations, general and individual documents falling in its scope; takes administrative and other measures during inspections; decides upon appeals against first-instance decisions issued by the cantonal inspectors pursuant to the cantonal regulations; coordinates work of Federal and Cantonal Inspectorates, follows the work and conducts expert supervision and control of work by cantonal inspectors and administrations for inspection affairs within the scope provided by the Federal regulations; provides expert assistance to the cantonal administrations for inspection affairs; enacts the programs and plans for inspection supervision for Federal Inspectorate, approves annual programs and work programs related to inspection supervision by cantonal administrations; maintains the records in regard of all those subject to supervision in the Federation; maintains the records of inspections conducted by the Federal inspectors; maintains the records on Federal inspectors; maintains the records on official ID cards of Federal inspectors; enacts the programs for professional trainings for inspectors for the Federation; organizes professional inspector examination in the Federation; takes part in professional drafting of inspection regulations; ensures enforcement of regulations enacted by the organs of Bosnia and Herzegovina setting out jurisdiction for enforcement of such regulations in the Entities and is liable for enforcement thereof and notifies the organs of Bosnia and Herzegovina on measures taken; carries out other administrative and professional tasks set out by the Federal laws and other regulations .

The following Inspectorates within FAII perform inspection tasks pertaining to environmental protection, including waste management:

- Inspectorate for Urban and Environmental Inspection – this Inspectorate is responsible for the inspection and implementation of laws and by-laws pertaining to environmental protection of the improvement of the environment; and
- Health Inspectorate – this Inspectorate is responsible for the inspection of the implementation of laws and by-laws pertaining to disposal and destruction of pharmaceutical wastes.

The Law on Inspections in FBiH (Official Gazette of FBiH, no. 69/05) defines the competencies and scope of work between the FAII and Cantonal Inspectorates. According to this Law, FAII undertakes inspection over the application of regulations within the jurisdiction established by federal legislation in the entire territory of FBiH. According to this Law, the Cantonal Inspections are also authorized for inspection over application of federal regulations. Exceptionally, the FAII may undertake inspection within the competence of the cantonal inspector over the application of federal regulations if the Cantonal Inspectorate does not have staffed inspectors. In case of conflict of jurisdiction between the federal and cantonal inspection, it is solved by the Director of the FAII and Head of the cantonal inspection authority by mutual agreement within three days upon conflict of jurisdiction. If a jurisdictional dispute cannot be resolved by mutual agreement within this period, conflict of jurisdiction is settled with the Supreme Court of the Federation of Bosnia and Herzegovina.

Environmental monitoring in FBiH is conducted based on the provisions of the Environmental Permits, respectively in accordance with the Law on Environmental Protection (Official Gazette FBiH, no. 33/03, 38/09) and relevant by-laws. However, existing non-sanitary landfills do not have Environmental Permits and the permits are issued during the projects for rehabilitation of these non-sanitary landfills. Environmental monitoring will be obligatory after remediation and closure of non-sanitary landfills. In accordance with the Law on Environmental Protection, environmental monitoring is conducted by engaging authorized third parties, such as accredited laboratories.

Federal Institute for Statistics (FIS)

The Federal Institute for Statistics gathers and organizes statistical data and undertakes relevant statistical research for the Federation.[9] The Department of Industry, Construction, Agriculture, Forestry and Environmental Protection Statistics is responsible for environmental statistics including waste. The Federal Institute for Statistics has the obligation to forward data to BiH Agency for Statistics in line with the national Law on Statistics (Official Gazette of BiH, no. 26/04 and 42/04). According to the Law on Statistics in FBiH (Official Gazette of FBiH, no. 63 / 03 and 09/09), cantonal authorities and other cantonal institutions, as well as city and municipal administrative services and other urban and municipal institutions and all other waste generators are obligated to submit data upon the request and as specified in the detailed Annual Work Plans.

The Federal Institute for Statistics (FIS) is in charge for preparation, collection, storing, processing, compilation, analysis and distribution of statistical data at FBiH(entity) level (including collection of relevant municipal waste) and submits the statistical reports to the Agency for Statistics of BiH.

The Environmental Fund of FBiH conducts collection of waste data independently from the FIS from operators of EPR schemes. The list of obliged payers is prescribed by Regulation on Management of Packaging and Packaging Waste (Official Gazette of FBiH, no. 88/11 and 28/13) and Regulation on Management of Waste from Electric and Electronic Equipment (Official Gazette of FBiH, no. 87/12 and 107/14). Operators of the system for packaging and packaging waste and electrical and electronic waste are obliged to officially inform FMET and Environmental Fund of FBiH, inter alia, about amount of collected waste, and amount of recovered, recycled and disposed waste. Obliged payers that have

[9] The Federal Institute for Statistics was established in April 1997, under the Law on Federal Ministries and Other Bodies (Official Gazette of FBiH, no. 8/95 and 9/96).

not joined the organized systems through authorized system operators, are required to submit their data to the Fund directly. All obliged companies are reporting using provided forms and tables available publicly at the Fund's web site[10].

Based on the information given by the Agency for Statistics of BiH, there is no coordination with Environmental Fund of FBiH regarding waste data collection and both institutions are conducting their activities regarding data collection independently. The Agency for Statistics of BiH has never initiated cooperation through requesting data and information on waste pursuant to Article 8 of the Law.

The amendments of Waste Management Law from 2017, prescribe the establishment of an information system for waste management in the FBiH as a series of interconnected databases and sources of data on all types and streams of waste, entities and infrastructure of waste management. The manner and financial technical aspect of establishing, maintaining and maintaining this system, as well as the deadlines for reporting and the manner of delivery of information on waste will be regulated by implementing regulations.

The Environmental Protection Fund will be responsible for the establishment and implementation of the information system.

3.2.2 Cantonal level

Cantonal Environmental Ministries

FBiH is composed of ten cantons whose jurisdiction is defined by the Federation's Constitution. Article 11 of the Law on Waste Management (Official Gazette of FBiH, no. 33/03, 72/09) states that cantonal ministries are in charge of MSW management and determining appropriate sites for the development of waste management infrastructure in line with the regional concept defined in the FWMS and FWMP. Cantonal ministries are also responsible for the development of cantonal waste management strategies and plans, drafting laws and regulations for the cantonal jurisdiction, issuing permits for waste management activities and environmental permits for waste management plants and facilities below the threshold stipulated in the Regulation on Plants and Facilities. The threshold is the amount of waste to be managed at the facility and/or area of waste management facility.

In certain respects, competency is shared between FMET and competent cantonal authorities. For example, cantonal authorities are responsible for issuing the majority of waste management permits, other than for those that are issued for facilities and activities which have inter-cantonal characteristics. In addition to the provisions of the Law on Waste Management, MSW management is also regulated by the cantonal Laws on Utility Services and municipal Decisions on Utility Services. The competent authorities for utility services are defined within the laws, as well as legal persons that can perform utility services (including for municipal waste management services). Cantonal Laws on Utility Services also define which utility services are regulated in detail by the municipal regulations. Based on the cantonal Laws on Utility Services, the municipalities can adopt implementing regulations governing the utility services at municipal level (this includes management and disposal of municipal waste).

According to the Decree on Determination of Spatial Intervention and Constructions for which the Federal Ministry of Physical Planning Issues Urban Permits and/or Location Information[11], construction of (i) cantonal and regional centres for waste management and (ii) facilities for treatment, storage and

[10] http://www.fzofbih.org.ba
[11] Official Gazette of FBiH, No. 32/14

disposal of hazardous waste require the issuance of an Urban Permit at entity level by the FMPP as such infrastructure objects are of interest to FBiH. The request for obtaining an Urban Permit is submitted to FMPP and includes all the documents stipulated by Article 39 of the Law on Physical Planning and Land Use at the Level of FBiH, including the Environmental Permit and the Preliminary Design. The Urban Permits, Construction Permits and Use Permits for projects of rehabilitation of landfills at municipality level are issued by the Municipalities on whose territory the landfills are located.

If for example, a private company wants to conclude a contract with a municipality for waste collection or constructing a sorting line at level of Municipality, the Municipality on whose territory the waste collection is to be conducted is transferring its authority of waste management to the selected company for waste management and issues the necessary Urban Permit/Construction Permit.

In another example, if the private company intends to construct cantonal and regional centres for waste management and (ii) facilities for treatment, storage and disposal of hazardous waste, Urban Permit/Construction Permit require the issuance at entity level by the FMPP, as such infrastructure objects are of interest to FBiH.

Cantonal Administrations for Inspection Affairs (CAIA)

At the cantonal level, inspections of waste management facilities are undertaken by cantonal inspectorates if they obtained their waste management permit from the authorised cantonal ministry. Exceptionally, Federal Inspectorates may undertake inspection falling under the jurisdiction of the CAIA if the CAIA does not have an appointed inspector under its jurisdiction.

Currently, Cantonal Administrations for Inspection Affairs as independent administrative bodies of the canton are not organized in two cantons of FBiH: Herzegovina - Neretva Canton and Central Bosnia Canton, where inspectorates are still organized under the umbrella of the cantonal ministries (under the Ministry of Economy of Herzegovina - Neretva Canton and in under the Ministry of Economy of Central Bosnia Canton). The other eight cantons have Cantonal Administrations for Inspection Affairs as independent administrative bodies.

3.2.3 Local level

Municipalities – Local Governments

Individual municipalities are responsible for the development of municipal waste management plans and the organization of waste collection and disposal activities on their territory. As a result, waste management services are typically provided by public utility companies (PUCs), which are fully or partly state-owned, or, to a lesser extent, by private companies contracted by municipalities (LLCs). Such utility companies are financially responsible for their operations – that is, they collect fees from households and pay gate fees to the landfill operators if they are part of a regional landfill scheme.

Consequently, municipalities are obliged to prepare and propose a development program, adopt and implement local waste management plans, regulate and ensure the provision of communal services and their development, organize management of municipal waste and non-hazardous waste in their territory, approve tariffs proposed by the public utility companies, provide funding for duties within their competence, and develop and manage tenders and contracts for the utility services.

Municipal departments for urban planning and utility affairs are responsible for waste management planning. Through these departments, municipalities engage utility companies to perform certain tasks in waste management at the municipal level (municipality may establish a PUC or these tasks may be contracted out to private companies).

Municipalities have organized Municipal Inspectorates for Municipal Order whose task is to oversee implementation of regulations at local governance level, regulations whose implementation has been

transferred from higher levels of governance (cantonal or federal). These Inspectorates are required to report to the mayor and municipal assembly on findings of inspections.

Private Sector

Private sector involvement in waste management is rather limited and is related to recycling and recovery of waste and waste collection from private companies. According to the Federal Law on Waste (Article 12) private companies can obtain licenses to become operators and perform waste management services including collection services, gathering, storage, treatment or disposal of wastes. Also, construction, operation and maintenance of plants and waste management facilities may be awarded under PPPs.

3.2.4 Packaging waste management

Institutional responsibilities of FMET, Environmental Fund, System Operators, etc. for management of packaging and packaging waste are defined in the Law on Waste Management (O.G. of FBiH, No. 33/03, 72/09) and the Regulation on Packaging and Packaging Waste Management (O.G. of FBiH, No. 88/11, 28/13).

The following stakeholders are engaged in the packaging waste managements system:

- FMET
- Environmental Fund of FBiH
- Manufacturers of packaging materials,
- Importers
- Fillers and packers,
- Distributors
- Final suppliers (retailers)
- End-users (consumers)
- Operators of the packaging waste management system
- Cantons and municipalities in accordance with Articles 25, 26, 27 and 28 of the Law on Waste Management
- Companies engaged in collection, transport and final disposal of waste authorised by the cantons or municipalities
- Companies engaged in collection, transport, recycling and recovery of waste
- Competent inspection bodies for supervision of the market and the environment

In line with the Regulation, two System Operators have been given a licence by the Federal Ministry of Environment and Tourism to operate in FBiH:

- EKOPAK - http://www.ekopak.ba/en/home
- EKO ŽIVOT - http://ekozivot.ba/

At present, these two operators are obliged to achieve the targets defined in the Regulation.

System Operators are required to organise the management of packaging waste on behalf of the companies which have transferred their obligations them. The System Operators undertake to arrange the following:

- Ensuring that municipal packaging waste is regularly taken over by a collector and separated
- Collection of packaging waste that is non-municipal waste from end-users;
- Reuse or recycling of packaging waste in authorised plants;
- Disposal of the unusable part of packaging waste at authorised regional or municipal landfills.

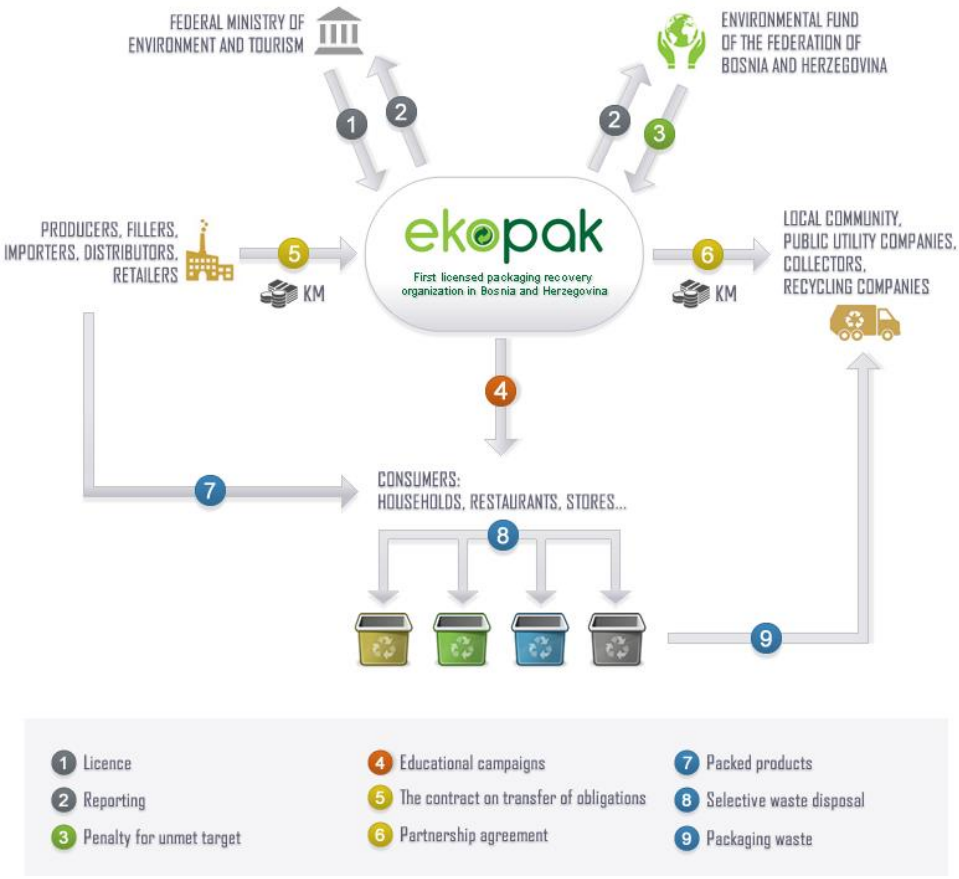

Figure 3-2: The scheme of functioning of the system of packaging waste management in FBiH
(Source: EKOPAK, available at: http://www.ekopak.ba/en/pages/5/principles)

The operator of the system is obliged to ensure packaging waste management process as a whole in accordance with the concluded contract for each type of packaging for which producers, importers, fillers/packers, distributors and final suppliers transferred their obligations to the Operator.

3.2.5 WEEE management

Institutional responsibilities of FMET, Environmental Fund, System Operators, etc. for WEEE management are defined in the Law on Waste Management (O.G. of FBiH, No. 33/03, 72/09) and the Regulation on WEEE Management (O.G. of FBiH, No. 87/12, 107/14).

According to Regulation the following entities are included in WEEE management system:

- Manufacturer of EEE
- Importer
- Distributor
- Companies which collect, transport and dispose of WEEE authorized by the Canton or the Municipality,
- Companies which collect, transport, recycle or recover WEEE, End user
- System operator (Producer Responsibility Organization)
- Environmental Fund of FBiH
- Inspection

In FBiH, two System Operators have been authorised by FMET for WEEE management:

- ZEOS eko-sistem Ltd. - http://zeos.ba/
- KIM TEC ECO Ltd. - http://www.elektrootpad.ba/

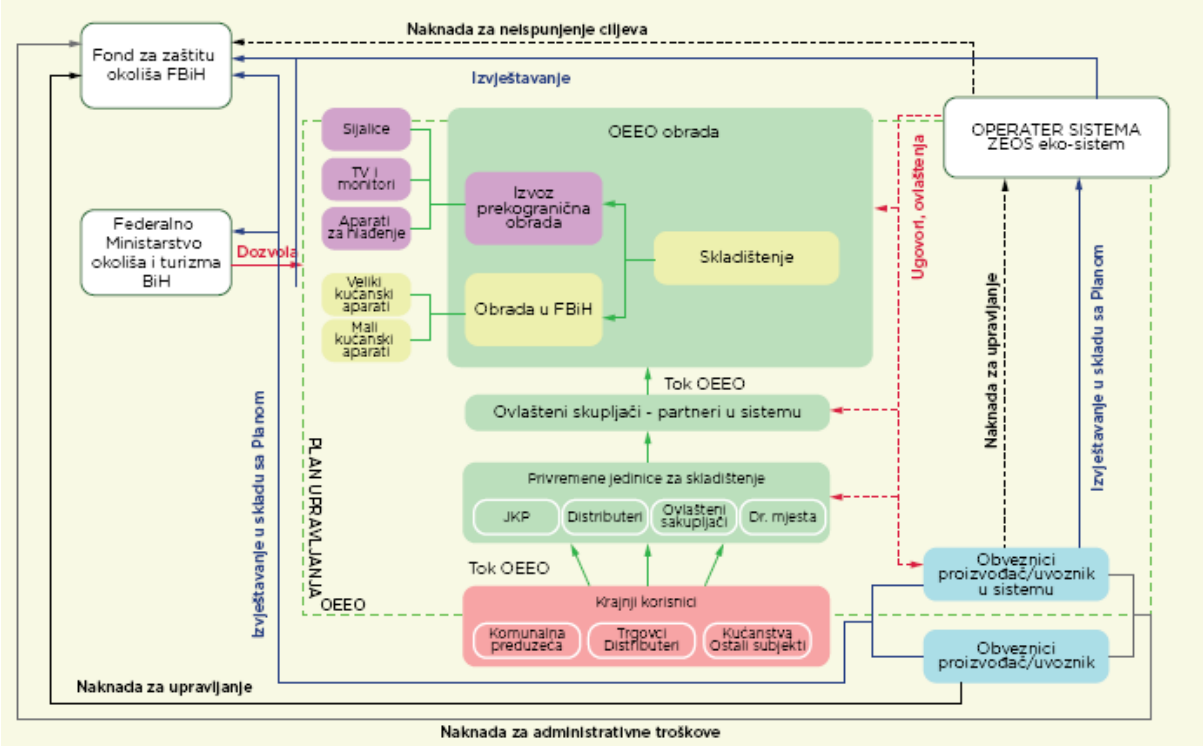

Figure 3-3: The scheme of WEEE management in FBiH
(Source: ZEOS eko-sistem Ltd, Annual Report 2014)

Although the setting up of the system is still in its initial phase, the problem lies in the fact that adoption of WEEE regulations is not harmonized across BiH as a whole (in RS the adoption of regulations covering WEEE is still pending). This has resulted in issues of competitiveness as prices charged for EEE in FBiH have to include the cost for end-of-life management whereas this is not the case in RS.

For the application of the Regulation on Management of WEEE, the penalty provisions in accordance with Art. 52 and 53 of the Law on Waste Management and other special regulations shall apply. No specific sanctions have been determined for WEEE.

According to the Regulation on WEEE Management the collection and management of WEEE needed to be organised by System Operator. System Operators had to be authorised by the Federal Ministry of Environment and Tourism (FMET). In May 2013, ZEOS Eco-system Ltd became the first company to be authorised under the regulations. In January 2014, the second System Operator, Kim Tec Eco Ltd, received official authorisation. System Operators are required to submit to the competent authority a five-year plan to achieve the required objectives set out in the Regulation (including the targets).

According to the annual report of ZEOS Eco-system for 2016:

- The PRO has 170 members
- The quantity of electrical and electronic equipment placed on the market in FBiH by the members of ZEOS was 6,483 tonnes (9 453 tonnes at national level).
- 64 places for collection of WEEE were established in different FBiH cities

The quantity of collected WEEE by ZEOS system was 598 tonnes (9%) of which:

- 60% Large domestic appliance
- 28% small household appliances
- 7% Cooling appliances
- 4% TV and monitors
- 1% luminescent lamps

According to the ZEOS Eco-system 24.652 kg of hazardous waste was exported abroad for processing in 2016: 19.840 kg or 143 pieces of cooling appliances are exported to Austria (UFH Remondis GmbH) and 4.812kg/37000 pieces of lamps are exported to Germany (Larec GmbH). The total quantity of WEEE exported since the start of operation in 2014 exceeds 300 tonnes.

There are no publicly available data about the WEEE quantities collected by the second system operator.

In Bosnia and Herzegovina is done the processing of small appliances and large domestic appliances, first stage of processing of TV and monitors. The processing of cooling appliances, bulbs and cathode ray tubes from monitors is done abroad. The reason for the exports is the absence of appropriate treatment and processing plants in Bosnia and Herzegovina.

3.3 Service provision and infrastructure

3.3.1 General overview of municipal waste management in FBiH

The information about municipal waste management in FBiH is based on the *Municipal Solid Waste Management Sector Review: Strategic Directions and Investment Planning up to 2025*.

It is estimated that in FBiH 2,219,220 inhabitants produce around 640,000 tonnes of waste per year in 2013 with 60 percent being generated in urban and 40 percent in rural areas.

For planning purposes the MSW generation in urban areas is estimated to 1.05 kg/capita/day and 0.55 kg/capita/day in rural areas that corresponds to an average generation rate at federal level of 0.8 kg/capita/day. These figures are comparable to the data provided by the BiH Agency for Statistics that estimate the municipal waste generated in 2015 to 325 kg/cap/year. This figure should be taken with some caution since (i) approximately 35% of the population is not covered by regular waste collection services and estimated amounts are provided and (ii) only 4 regional landfills have weigh bridges serving 24 out of 79 municipalities and the waste quantities collected and disposed at the remaining landfills are estimated on basis of truck size and number of daily disposals.

The amount of dry recyclables (plastic, glass, paper, metals, aluminium cans, PET) according to several studies held in different BiH cities accounts for 24-38% of the total waste. The percentage is lower in rural municipalities and higher in the urban cantons, especially Sarajevo Canton.

Taking into account the recyclable fraction in the residual waste and the recyclables collected through EPR system[12] (not disposed in containers but collected directly from commercial/institutional entities) the total amount of dry recyclables is estimated to approximately 210,000 t. The packaging waste is estimated to amount approximately 160,000 t. out of this quantity.

In FBiH, municipalities are responsible for the management of all municipal waste. Waste management services, including collection, transport and disposal, are mainly carried out by public utility companies

[12] 35% of 60,000 tons reported to be the quantity put on market by members of Ekopak and Ekoživot

(PUC). The legal status of most of the waste collection companies is a limited liability company (D.O.O.) in which the municipality is the sole shareholder. The activities of PUCs are usually not limited to waste management but also include water supply and sewage, street cleaning, and the maintenance of public areas. There is currently no practical cooperation between municipalities in terms of arranging PUCs which would serve two or more neighbouring municipalities and potentially making them more cost-effective. The municipalities in Sarajevo Canton are exceptions, as the Cantonal PUC of Sarajevo Canton collects waste from all the municipalities of the canton, whilst it also manages operations of the regional landfill.

Involvement of the private sector in the delivery of waste management services is very limited in FBiH.

Utility companies are financially responsible for their operations – that is, they collect fees from households and pay the required access fees to landfill operators if they are part of a regional landfill scheme.

A number of municipalities have signed up to inter-municipal agreements for regional landfilling. However, there are examples that some municipalities, although they are signatories of this inter-municipal agreement, do not dispose of their waste at the regional landfill (e.g. because of high landfill fees, and long distances from the municipality to the regional landfill).

Municipal waste collection systems from households are based on bring-systems and door-to-door collections. The waste collection system for households can be a mix of (i) bags delivery; (ii) the use of containers of 120/240 litres mainly for door-to door collection and (iii) the use of communal containers of 1,100 litres i.e. bring system which is the overarching system. In addition, 5-7 m^3 skips are used mainly for the commercial/institutional/industrial sector. The frequency of collections ranges from daily, weekly to monthly, with an average level of coverage through formal collection channels of approximately 65% to 70% (no data exists on the proportion of households which received a door-to-door collection service). Collection equipment consists of compactor trucks, skip loaders, dump trucks, tractor- trailer combination, and flatbed trucks. Approximately 85% of the collection trucks fleet is fully depreciated and older than 10 years.

In urban areas there are predominately bring-systems of municipal waste collection using Eurobins for residual waste (1,100 litres). In the central part of the City of Sarajevo and in the old town, waste is collected in plastic bags, and in the hilly parts of the rest of the city, due to narrow and steep streets, waste is collected in plastic bins. In semi-urban areas, residual waste collection services are based on bring-systems using 1,100 litre metal Eurobins or door-to-door collection using plastic bins (120 or 240 litres). In rural areas, there is predominately door-to-door collection using plastic bins (80, 120 or 240 litres).

The level of collection coverage differs significantly between the different municipalities. Waste collection service coverage is relatively high in the municipalities of Sarajevo Canton, (approx. 95%), as well as in Bihać (95%), Tuzla (95%) and Bugojno (90%), Čapljina (80%) and Mostar (75%), and Goražde (74%). The problems are encountered mostly in semi-urban and rural municipalities where the level of coverage of waste collection services is far lower, such as in the cases of Kalesija (35%) , Busovača (33%) and Kiseljak (22%). Where households are not covered by a formal waste collection service, they typically make use of unregulated dump sites or, in some cases, resort to burning their waste.

Landfilling is still the major disposal option for municipal waste collected. In FBiH, sorting lines for pre-separated dry recyclables are located at Sarajevo cantonal regional landfill and at Konjic municipal landfill. Two mixed waste separation lines are installed in Mostar regional landfill and Tuzla municipal landfill. There are no mechanical biological treatment (MBT) or thermal treatment plants constructed at present.

Currently (2017), there are 4 regional landfills constructed and operational in FBiH located in Sarajevo, Livno, Mostar and Zenica. These landfills receive waste from 24 municipalities. Furthermore, there are 9 municipalities that are currently transporting their waste to regional landfills in RS. Therefore, more than 1/3 of the municipalities in FBiH (generating more than 50% of total MSW) are currently serviced by one of the regional landfills in FBiH and/or RS, and the rest are still disposing their waste in wild dumps and non-sanitary municipal landfills.

Regional landfills are owned by the municipality on whose territory the landfill is constructed and also operated by the municipal or cantonal company in case of Sarajevo Canton. Users have to pay a gate fee set by the municipality owning the landfill. There seem to be a big variation in collected gate fee. Moscanica landfill in Zenica receives BAM 45.7/ton (excl. VAT) while Uborak in Mostar can hardly collect BAM 25/ton (excl. VAT) from member municipalities. Sarajevo regional landfill is operated by a cantonal company operating both collection and disposal facilities and thus no landfill gate fee is imposed except for non-hazardous industrial waste delivered by third parties.

In addition to these regional landfills and non-sanitary municipal landfills, there are approximately 1,800 dumpsites (Federal SWM Strategy) used for illegal disposal of waste.

The public utility companies providing waste management services are responsible for setting the fees and charges for waste collection and the municipalities approve these rates. The most common method of fee-setting is a single lump sum per household, followed by calculation based on a dwelling's surface area of (mostly in urban areas). The least used method is the calculation per number of household members. Fees for businesses depend on the type of business and are usually calculated per m^2 of office space (based on the classification of office space) and, to a lesser extent, as lump sum on the basis of activities performed by the business.

The weighted average tariff/year for the served households is BAM 102/hh/year or BAM 113/ton (incl. VAT) which is 0.5% of the spendable income. The waste collection companies are responsible for contracting households and commercial, institutional and industrial (CII) entities and for the collection of the tariffs. Thereto they employ tariff collectors and extra administrative staff resulting in extra costs and risks. Tariffs are considered to be low and usually not take into account the amortization costs.

Tariffs for household type waste from the commercial and institutional sector are substantially higher than for households.

In FBIH, depending on the municipality, unpaid fees can amount to between 50% and 70% of the total costs. The substantial proportion of unpaid fees is reportedly due to the fact that municipalities and PUCs can only pursue charges through the courts and have no other legal instruments to make people pay for their waste collection services. Taking households to court is expensive and takes a long time so is seldom pursued.

Notwithstanding the low costs, the level of cost recovery for waste management is generally thought to be low. Municipal officials indicate that rates of cost recovery are below the full costs due, at least in part, to an inability to collect payments from a large proportion of households. Also, for political reasons, charges are often set at levels which are too low to cover costs.

Proposals for new tariffs are prepared by the waste collector considering the cost developments. The calculations are checked by the Municipal Department for Communal Affairs and subsequently submitted to the City Council for approval. However, in many cases the tariffs have not been increased for many years. Municipalities are rather reluctant to increase the tariffs for households for economic and political reasons.

The waste collection company is responsible for concluding service contracts with each waste generator both households and CII sector. This imposes a heavy administrative burden in addition to the financial risks of non-payments, which might result in time-consuming court cases.

In the tariff calculation, all operational and amortization costs should be included covering collection, transport and disposal. However, there is no legislation or guideline on the methodology to calculate the tariff. Currently all services are subject to 17% VAT both for the households and for the CII sector.

The municipality (and/or the Canton) might buy equipment or subsidize directly the waste collection company by taking over payments wholly or partly for operations of landfills, sorting lines, gate fee at regional landfills, etc.

No additional financing is received from State, Entity or Cantonal level except for some grants from the Fund for Environmental Protection for specific project investments. This allocation is made on basis of a public call to submit projects. Otherwise the municipalities have to pay for investments. The municipalities may receive grants from the EU and other donors or conclude loans for investments. The operational and capital (amortization) costs have to be financed from revenues such as tariffs, income from additional services such as street cleaning, green areas maintenance, etc. and subsidies.

The EPR system can provide payments for containers, public awareness raising activities and sorting activities to increase separation/quality of packaging waste in case the municipality has a contract with the EPR scheme.

The existing waste management set-up for both waste collection and disposal is inadequate in most municipalities. Main challenges facing the current waste management system and its operations are:

- Having a significant number of residents living in rural areas without waste collection services leads inevitably to uncontrolled dumping of waste;
- The number of uncontrolled landfills and dumpsites is high;
- Facilities do not conform to recent technical standards and thereby pose a risk for human health and the environment;
- Separate collection and sorting of recyclable waste is undeveloped, composting and anaerobic digestion of bio-waste is not practiced and there is no pre-treatment of residual mixed waste prior to landfill;
- Whereas tariffs set for waste collection approach their full-cost recovery levels, those for disposal are very low and fail to provide the financial incentives needed to motivate acceptable disposal practice. Tariffs will need to rise considerably before the minimum standards of international good practice can be met;
- Low levels of cost recovery from users make service providers reliant on budget transfers from municipal and central government funds;
- Legislation is fragmented, with regulatory provisions distributed across a number of legal acts.
- Control over waste disposal operations is weak and mechanisms to enforce legal compliance are only poorly developed and implemented;
- Public administrations responsible for the municipal waste sector do not have the resources needed to manage modern and increasingly complex systems;
- Current institutional arrangements do not support the involvement of the private sector and create unnecessary barriers to attracting investment;
- Poorly developed arrangements for inter-municipal cooperation are an obstacle to the creation of modern waste treatment and disposal infrastructure; and
- People generally are poorly informed on all aspects of modern municipal waste management.

3.3.2 Separation at source and separate collection of municipal waste

The separation at source and separate collection practices in BiH are not well developed at present and far beyond the objectives specified in the Federal Waste Management Strategy 2008-2018[13]. It is reported that separation at source from municipal waste is less than 0.5%[14] and collection directly from CII sector would be about 3% of the generated municipal waste.

The separate collection of household recyclable waste, including packaging waste is practically not implemented. The FBiH legislation does not provide a clear guidance on responsibilities of municipalities related to the organization of municipal waste separate collection services and obviously these activities are not a priority for the local authorities.

Limited numbers of separate collection containers are installed in some settlements. For example, in 2004, the Sarajevo based Cantonal PUC "Rad", initiated household waste recycling through a series of recycling projects followed by several campaigns. These projects entailed the introduction of recycling infrastructure, such as containers[15] for paper and cardboard, polyethylene terephthalate (PET) packaging and cans, but also specialised vehicles for collecting recyclable materials, and a waste sorting line at the Smiljevići landfill. The waste separation line started to operate in January 2007. The line is currently used only for sorting already pre-selected recyclables (e.g. PET packaging, paper and cardboard, plastic packaging and metal packaging) collected from the drop-off locations found in certain parts of the City of Sarajevo. The results of these activities are disputable as in 2016 only 538 tonnes of waste were separated for recycling. The actual result are even lower considering that part of this amount was separated directly at the landfill site.

In Una-Sana Canton, in the municipalities of Bihać, Cazin, Velika Kladuša and Sanski there are containers for separate waste collection. PUCs collect the dry recyclables (primarily paper and cardboard, PET packaging and other plastics), compact them and sell them to recycling companies.

In Central Bosnia Canton, in the municipalities of Travnik and Novi Travnik, PUCs also perform collection and compacting of paper and cardboard, PET packaging and other plastics. The baled materials are then sold to recycling companies.

[13] The Federal Waste Management Strategy 2008-2018 sets separation and sorting targets as follows: (i) the establishment of separate collection system in 80% of the municipalities in 2014 and 95% in 2018 and (ii) packaging waste should be separated up to 20% in 2014 and 30% in 2018 or 7% and 10% of total waste, respectively

[14] The total quantity mentioned in the questionnaires is 790 tons or approximately 0.23% of the total collected waste quantity

[15] According to Waste Management Plan of Canton Sarajevo, in the Sarajevo Canton there are 560 1,100 litre containers for the separate collection of paper (blue containers) and PET (yellow containers). In addition, there are 12 igloo type containers of 2,000 litres each (6 blue and 6 yellow); however, these are only to be found in certain parts of the city.

Figure 3-4: Waste Separation Line at the Regional Landfill Smiljevići Sarajevo
(Source: KJKP Rad d.o.o. Sarajevo)

Some municipalities have reportedly introduced drop-off stations – otherwise known as 'recycling yards' – for the collection of recyclable materials. This is still not a widespread practice and the majority of these recycling yards have been developed as pilot projects in certain areas. Recycling yards are typically larger yards or container parks, the size of which varies depending on the number of inhabitants that it services. These facilities can be located on the edge of town or closer to the centre, depending on the availability of space and the geography of the region. The recycling yard is usually fenced and fitted with bins and containers ranging from 1,100 to 5,000 litres for the separate collection of bulky waste and other recyclables. Depending on the size of facility the following materials may be separately collected: waste paper and cardboard, glass, scrap metal, plastics, tyres, bulky household items, appliances, used oils, and batteries.

The situation did not change significantly with the start of EPR schemes for packaging waste organized by Ecopak and Ekoživot. Both organizations implemented several small-scale projects through providing separate collection containers to PUCs in more than 20 municipalities. The size of these projects is very small and the number of containers is not sufficient to effectively organize the service in the respective area. The contribution of these projects to the achievement of recycling and recovery targets is negligible. The activities of PROs are mainly focused on PR events and public awareness.

Despite separate collection of waste from households is not sufficiently developed there are some positive examples. One of them is the programme for separate collection implemented for several years in the city of Gračanica based on cooperation contract signed between EKOPAK and J.P. „Komus" d.o.o. Within the programme 120 l plastic bins were provided to approximately 8000 households and every month they receive empty yellow and blue bags for separation of packaging waste.

The contribution of municipal waste sorting to the recycled quantities in FBiH is also not significant.

The real recycling activities in FBiH are organized independently from the municipal waste collection services and operate entirely on commercial basis. Private companies collect and trade with recyclable waste commodities and following some limited preparations and processing the collected waste is exported abroad or sold to recycling plants in the country. Some of companies collecting recyclable waste are specialized in paper and/or plastic collection, others are metal scrap dealers where collection of other recyclable waste is supporting activity. The profile and size of these companies is different with turnover varying from several thousands to 2 - 3 millions EUR per year.

The collection of recyclable waste from large supermarkets and other commercial outlets is relatively well developed in the large cities. The collection of industrial and commercial packaging is organized in principle independently from PRO[16].

Significant quantities of paper and plastic waste are collected by individual collectors directly from the municipal waste containers or picked up at the landfills and then delivered to buy-back centres.

The collection is focused to materials where the revenues cover the collection and preparation costs: like metal scrap, paper and cardboard, foils, PET bottles, large items of rigid plastics.

There is no detailed and comprehensive information about the quantities of separately collected and recycled waste in FBiH. Nevertheless, it can be assumed that the quantities of recyclable waste already collected from CII and informal sector are higher than recyclable waste targets set for the first years of implementation of EPR system. The very rough estimate is that the quantities of recycled packaging waste is in the range of 20,000 – 30,000 tonnes.

The private recyclable waste collection companies (RWC) have much more experience in the trade of recyclable waste commodities than newly established PROs and communal companies.

The RWC companies consider the PROs as partner and potential source of additional revenue. Till now the RWC are the main contributor for the achievement of recycling targets. The practice is RWC to deliver waste on behalf of PRO. The PROs do not own the material collected and have no influence on collection practices and decision about the final destination of waste. The PROs are paying additional fee to the RWC in order to receive the necessary proofs for waste recycling.

3.3.3 Sorting of municipal waste

Two mixed waste separation lines are installed in Mostar regional landfill and Tuzla municipal landfill. The installed capacity of mixed separation line at Mostar regional landfill is 15 t/h. In 2016, the line processed approximately 70% x 41,000 tons mixed waste resulting in 790 tons dry recyclables or 2.7%. The mixed waste separation line at Tuzla municipal landfill processed approximately 15,000 t in 2016 generating 360 tons recyclables or 2.4%.

Two sorting facilities for separately collected dry recyclables with a capacity of 5 t/hour are operating in Konjic and Sarajevo.

As reported by PUCs, up to now the results of the installed sorting/separation lines are far below expectations and financially unsustainable. The reasons are (i) the low waste quantities/year; (ii) low awareness with the waste generators for proper separation at source; (iii) role of private sector that is buying directly from the CII (also as a part of the EPR system) and informal sector that is buying directly from the CII and taking valuable dry recyclables out of containers.

The review of market prices for dry recyclables obtained from four sorting locations are indicated in Table 3-4.

Table 3-4: Revenues from sorting of dry recyclables in 2016 (BAM/ton)

Material	Zenica landfill	Konjic	Sarajevo	Mostar

[16] The retail chain BINGO is shareholder and founder in Ekoživot and the quantities of collected commercial packaging can contribute for the achievement of recycling targets

	Quantity (ton)	Price/ ton	Quantity (ton)	Price/ ton	Quantity (ton)	Price/ ton	Quantity (tons)	Price/ ton
Paper/cardboard	76	135	160	140			300	160
Plastics			25	400			330	300
-PET	104	500						
-Hard	11	420						
Metals	6	220	26	0			94	600
Glass	0		44	30			40	40
Total	197	347	255	147	538		764	268

The prices reported by Konjic sorting plant and the actually received amounts in 2016 in Konjic indicate lower prices i.e. paper/cardboard BAM 97/ton, plastics BAM 245/ton and glass BAM 16/t.

The reported amount for separated quantities in Sarajevo include quantities separated from the landfill (approximately 150 t/y), source-separated quantities directly from the CII sector and quantities from the sorting line for dry recyclables. It can be concluded that the separated annual quantities are extremely low due to low throughput and high percentage of rejects as a result of bad input quality and bad separation.

The PRO for packaging waste didn't contribute so far for the development of sorting infrastructure for separately collected waste.

3.3.4 Role of the informal sector

According to the *Light Touch Market Study for Scrap Material – Bosnia and Herzegovina*, there are waste pickers present in practically all towns.[17] The waste pickers mostly collect scrap metal, and, to a lesser extent, scrap cardboard, as these materials tend to have higher market values. The waste pickers collect materials from local dumps, road containers, and directly from households (as a form of door-to-door collection). The average number of waste pickers operating at major dumps on a daily basis reportedly ranges between 5 and 10. Similar numbers have been noticed collecting scrap materials on a weekly basis in small towns or urban neighbourhoods with populations of several thousands. Some waste pickers sell the collected scrap copper and discarded aluminium cans to dealers.

An unknown number of dealers (roughly estimated at approximately 1 per several thousand inhabitants) are scattered across the country, and they collect and/or buy mostly scrap metal. The informal dealers typically have an open-air area to store the scrap materials. Some of them also stockpile end-of-life vehicles.

A 2006 report suggested that official data on the number of waste pickers in BiH does not exist and no more recent data was found as part of this study.[18] The survey of 659 individual collectors (including 595 Roma People) conducted as part of the study showed that ferrous and non-ferrous scrap metals were the most frequently collected materials (aluminium - 91%, iron - 90% and copper - 85%). The collection of metals was followed by waste pickers who focused on car batteries (39%). Other kinds of recyclables were shown to be collected to a significantly lesser extent – paper (15%), plastic (13%), and glass (5%). The report noted that waste pickers typically look for recyclables in residential areas, at landfills and waste dumps, and, to a lesser extent, in industrial areas.

[17] International Finance Corporation (2004)*Light Touch Market Study for Scrap Material – Bosnia and Herzegovina*

[18]International Finance Corporation (2006) *Assessment of Recycling Sector in Bosnia and Herzegovina*

The role of individual collectors is the most disputable point of the collection of recyclable waste in BiH and other Eastern European Countries. The recovery organizations insist on the closure of buy-back centres and introducing a legal ban on the sales of materials from individual persons with the argument that most of the materials delivered by them are stolen from the separate collection containers.

On the other hand, it shall be recognized that significant number of people get revenue from picking up and selling recyclable waste to buy-back centres. The majority of these people have no other chances for realization in the society. Waste scavenging is a social problem and cannot be solved with administrative measures only.

3.4 Documentation and reporting requirements

Inside the Federation two parallel waste information systems are operating i.e. the Environmental Fund using its own forms and the Federal Institute for Statistics using their own forms based on EU statistical reporting requirements. The Institute is sending its information to the State Agency for Statistics for statistical purposes and reporting to the EU. There is no institutionalised cooperation between the Environmental Fund and the Institute for Statistics. Data from the various organizations can differ.

Currently, planning and guidance for the implementation of effective and efficient waste management systems at entity level are hampered by the lack of reliable data on waste generators, quantities, composition, recovery, recycling, disposal, stakeholders and so on.

A comprehensive Waste Information System (WIS) is needed in order to provide required data for national and international reporting, improve access to waste data, support regulatory reform and associated reporting, support a consistent and comprehensive data capture process, provide accurate and reliable data to inform decisions, strategies and business, support consistent methods, classification and terminology for waste data, and to support state and regional regulations.

The implementation of a national WIS will standardize reporting requirements, definitions, units and terminology at all administrative levels. The information system should be regularly updated by standard reporting procedures and should capture the national, entity, regional and local evolution of waste management systems. Regional landfills, municipalities, big waste generators from the business sector, EPR systems and treatment facilities should participate in the regular reporting system. An inventory of respondents at entity level should be carried out. The responsible organization could be the Fund for Environmental Protection of FBiH in close cooperation with the Federal Ministry of Environment and Tourism and the Agency for Statistic of BiH.

Agency for Statistics of Bosnia and Herzegovina (BHAS)

In 2008, after a long gap in data collection, the Agency for Statistics of BiH (BHAS), in cooperation with the Federal Institute of Statistics and the Institute for Statistics of RS, started consolidation of a nationwide municipal, industrial and hazardous waste database from the reports and responses to questionnaire surveys. The survey provides structural data on waste according to EWC-Stat and in line with the Regulation on Waste Statistics 2150/2002/EC. However, the quality of the data could be greatly improved. This could be achieved through close collaboration between the state and entity institutions for statistics, FMET, the RS Ministry of Spatial Planning, Civil Engineering and Ecology (MSPCEE), the Department for Urban Planning and Property Affairs of BD Government (DUPPA) and the cantonal authorities; all of which are receiving data and information on waste from waste management service utilities, enterprises and others.

BHAS performs tasks that relate to organising, producing and disseminating statistics for the country as a whole. The Agency operates in line with the Law on Statistics of BIH (O.G. of BIH, No. 26/04 and 42/04) and it is the competent body to process, disseminate and endorse Statistics of BIH. This law establishes the legal framework for the organisation, production and dissemination of statistical data in

B&H. The Agency collects, processes and distributes statistical data of BIH in accordance with internationally accepted standards based on data submitted by the entity statistical institutes or data collected directly by the Agency.

BHAS processes data obtained through statistical surveys entitled “Annual Report on Collected Municipal Waste” (form KOM-6aS) and “Annual Report on the Amount of waste Brought to Landfill Sites" (form KOM-6aD). These Reports are submitted by public utility companies and other companies authorised for collection and disposal of waste as well as by operators who manage landfills and waste disposal sites.

There are no reliable data on waste generation in BiH. In 2012, BHAS published "Quality Report for Statistical Surveys - Methodological Guidelines for Preparation". The aim of this publication was to provide recommendations for preparation of comprehensive quality reports for a full range of statistical processes and their outputs, in line with recommendations of the European Statistical Office (Eurostat). The Agency drew up a list of standard indicators on the basis of the Standard Quality Indicators of Eurostat. These indicators were developed by a special Working Group set up by Eurostat for the purpose of quality monitoring in the European Statistical System. The "Quality Report for Statistical Surveys - Methodological Guidelines for Preparation" gives an instruction for preparation of the Quality Report in a standard format. Quality report is produced annually (annual reports), regardless of the periodicity of conducting statistical survey. Report prepared by statisticians responsible for some statistical survey in cooperation with the staff responsible for sample analysis and IT. In the period from 2012 to 2014 BHAS produced several quality report for statistical surveys; however, none of them was for the sector of waste management.

No detailed waste composition data is available at the level of BiH. BHAS annually publishes data on collection and disposal of municipal waste, but this data suffers from a number of data quality issues. According to data of BHAS, only a few business entities submitted data on waste quantities obtained by direct measurement, since only a limited number of landfills have weighing equipment. Where direct weight measurements are not available, estimates are made based upon number of vehicles delivered and their capacity. Furthermore, waste utility companies have not started applying a uniform methodology for data collection or a standard definition of waste.

Data on waste from production activities were collected by BHAS and published in the Annual Waste Report on Waste Created in Manufacturing Activities, in accordance with the Annual Plan of Implementation of Statistical Activities. Reporting units are business entities and parts of business entities that are registered in the NACE sector B - Ore mining and quarrying, C – Manufacturing and D - Electricity, gas, steam supply and hot water, and have 10 or more employees. Where records and documentation are not available, reports are based on estimated data. These data on quantities, types and flow of waste generated in ‘production process in industry, crafts and other processes’ still do not give a full picture of waste arising and flows in BiH. There is a lack of information about other industrial or non-household wastes.

Presently there are no specialized statistical surveys about the quantity of packaging and electrical and electronic appliances placed on the market.

Federal Institute for Statistics

The Federal Institute for Statistics (established on April 21, 1997, based on the Law on Federal Ministries and other bodies (O.G. FBiH, No. 8/95 and 9/96)) performs tasks that relate to the organizing and conducting of statistical research in FBiH. The Department of Industry, Construction, Agriculture, Forestry and Environmental Protection Statistics is responsible for environmental statistics including waste. The Federal Institute for Statistics has the obligation to forward data to the Agency of Statistics of BiH in line with the Law on Statistics of BiH (O.G. BiH, No. 26/04 and 42/04).

Federal Institute of Statistics processes data obtained through statistical surveys entitled "Annual Report on Collected Municipal Waste" (form KOM 6aS) and "Annual Report on Disposed Waste" (form KOM6aD). These Reports are submitted by public utility companies and other companies authorised for collection and disposal of waste as well as by operators who manage landfills and waste disposal sites.

3.5 Recycling and recovery targets

3.5.1 Recycling and recovery targets for packaging waste

Federal Waste Management Strategy 2008-2018 has defined the Operational Objective for municipal waste: "Collect and recycle packaging waste (% of total generation)" – the targets associated with this objective are shown in the following Table.

Table 3-5: Recycling Targets for Packaging Waste Defined in the Federal Waste Management Strategy 2008-2018

Operational Objective	2011	2014	2018
Collect and recycle packaging waste (% of total generation)	8%	20%	30%
Paper and cardboard	35%	45%	55%
Glass	1%	10%	40%
Metal	55%	60%	65%
Plastics	3%	6%	15%

Regulation on packaging and packaging waste management (O.G. of FBiH, No. 88/11, 28/13) has set objectives for the recovery and recycling of packaging waste. The Regulation had stipulated that by 2016, 35% of packaging waste placed on the market had to be recovered or recycled. The provisions of the Regulation apply to all packaging waste placed on the market in FBiH, whereas those included in the Federal Waste Management Strategy only cover materials recovered from municipal waste.

Table 3-6: Reuse or Recycling Specific Targets for Packaging Waste Defined by the Regulation on Packaging and Packaging Waste Management (O.G. of FBiH, No. 88/11, 28/13)

Packaging Material	Minimum quantity (%) that needs to be reused or recycled		
	2014	2015	2016
Glass	5%	8%	12%
Metal	4%	6%	10%
Paper	20%	25%	30%
Plastics	8%	12%	16%
Wood	5%	8%	12%
Multi-layer and other materials	5%	8%	10%
Packaging containing and / or contaminated with hazardous substances	5%	8%	10%

The Regulation on management of packaging and packaging waste (Official Gazette of FBiH 88/11, 28/13) sets collection and recycling targets packaging waste to 35% of the packaging placed on the market. According to the Federal Solid Waste Management Strategy total amount of packaging placed on the market is approximately 170,000 t/y. This figure shall be revised based on appropriate analysis of data, as the actually reported quantities are significantly lower. The current estimate of Fund for Environmental Protection of FBiH is that only 15% of packaging waste is recovered from the packaging that is placed on the market in FBIH. The general recycling and recovery target has been frozen until 2021.

The recycling and recovery targets in FBiH are considerably below the levels specified in EU Directive on packaging and packaging waste.

3.5.2 Separate collection, recycling and recovery targets for WEEE

Targets for take back and collection of WEEE are specified in Article 7 of Regulation on WEEE management. The targets are defined as percentage of the quantity of equipment placed on the market by the members of PRO. The targets are growing from 5% for the first year following the obtaining of permit from PRO to 25% for the fifth year of operation.

Minimum recycling and recovery targets are defined as a percentage by weight of WEEE for the different categories of equipment and are calculated from the full fifth year from the obtaining of permit by the system operator.

3.6 Recycling capacities

A 2008 study on the *Assessment of the Recycling Sector in Bosnia and Herzegovina* conducted a detailed investigation of 35 companies with an estimated combined market share of approximately 60%.[19] According to this study, three companies can be singled out due to their size and quantity of material processed:

- Natron Hayat, Maglaj, the largest paper mill in the country;
- Mittal Steel, Zenica, a steel manufacturer; and

[19]International Finance Corporation (2006) Assessment of the Recycling Sector in Bosnia and Herzegovina

- Weltplast, a plastic producer.

Natron Maglaj was founded in 1951 by the state of ex-Yugoslavia and has since been the largest producer of craft paper and packaging materials in the country. In May 2015, the company was privatised through a joint venture with the company Kastamonu Entegre, which is a member of the Hayat Holding Group from Turkey. In 2013, the capacity of paper production was 285 tonnes per day, and in the next investment cycle the company plans to increase production to 390 tonnes per day.[20]

Mittal Steel Zenica: The iron and steel works factory was founded in 1982 under the name Željezara Zenica and, at the time, mainly produced rolled products. The factory was subsequently transformed into a large industrial complex, with a coke oven battery, blast furnace and rolling mill plant. During the war in the mid-1990s the factory ceased production. In 1998, the company was revived by financing from Kuwait Consulting/Investment Co (Kuwait). Kuwait, through a joint venture with the State, formed a new company named BH Steel-Zeljezara Zenica. In December 2004, Mittal Steel, a global steel producer, acquired a 51% interest in BH Steel-Zeljezara Zenica from the Government of FB&H and subsequently, in December 2005, the Company acquired a further 41% from the Kuwaiti owner. As a result of the transaction, Mittal Steel now has a 92% share-holding in Mittal Steel Zenica. The Factory produces hot rolled products – for example, rebars, wire rod, mesh, lattice girders, and classic construction armature – mainly for Balkans, EU and North African markets. Although it was planned to reach a production capacity of 2,250,000 tonnes of steel per year, the plant currently produces less than one million tonnes, with total production amounting to 700,000 tonnes in 2012 (the facility has a maximum capacity of 1,000,000 tonnes per year).[21]

Weltplast is a privately owned company which was founded in 1984. It is the market leader in BiH for processing the polymers PE and PP. Its products include water pipes, gas pipes, PP pipes and links, PE packaging/bags and films as well as plastics used in agriculture. Recycled material is used only in the production of PE bags and films. Annual production in BiH and Croatia amounts to 10,000 tonnes (there are no available separate data for BiH only), including pressure HDPE pipes, PP pipes for home installation, dressed packaging, and industrial films.[22]

The recycling plants must have waste management permit and comply with the requirements of the environmental legislation.

The recycling plants are not actively involved in the setting of EPR system. They are keeping the existing waste supply routes and didn't rely entirely on the PROs for that purpose.

3.7 Analysis of EPR systems in place

The situation with the collection of recyclable waste is as follows:

[20] *Federal Ministry of Energy, Mining and Industry (2013) Ministar Trhulj Posjetio Kompaniju Natron-Hayat d.o.o. Maglaj, Date Accessed: January 2016, Available at:* www.fmeri.gov.ba/ministar-trhulj-posjetio-kompaniju-natronhayat-doo-maglaj.aspx

[21] Muhamedagić S. Duran S. (2009) *Impact of Metallurgical Production on Air Quality on Zenica City Area*, 6th Scientific and Professional Meeting with International Participation "Kvalitet 2009", Neum Bosnia and Herzegovina, 4-6 June 2009, https://ejatlas.org/conflict/arcelormittal-steel-production-factory-zenica-bosnia-and-herzegovina

[22] Weltplast (2016) *About Us*, Date Accessed: January 2016, Available at: www.weltplast.com/en/about-us.html

- The collection of recyclable waste from large supermarkets and other commercial outlets is relatively well developed in the large cities. The collection of industrial and commercial packaging is organized independently from PRO;
- Significant quantities of paper and plastic were collected by individual collectors from municipal waste collectors or at the landfills and delivered to buy-back centres;
- The collection is focused to materials where the revenues cover the collection and preparation costs: metal scrap; paper and cardboard; foils and PET bottles; large items of rigid plastics; the collection of glass from households is negligible;
- The collection of recyclable waste is mainly organized independently from municipal waste collection;
- The quantities of recyclable waste already collected are higher than recyclable waste targets set for the first years of implementation of EPR system;
- The separate collection of household packaging waste is practically not organized;
- The recyclable waste collection companies (RWC) have much more experience in the trade of recyclable waste commodities than newly established PROs and communal companies;
- The RWC companies consider the PROs as partner and potential source of additional revenue
- The practice is RWC to deliver waste on behalf of PRO. The PROs do not own the material collected and have limited influence on collection practices and decision about the final destination of waste;
- The PRO are paying additional fee to the RWC in order to receive the necessary proofs for waste recycling. The size of this additional fee is considerably below the market value of the respective material;
- The FBiH legislation does not provide a clear guidance on the financial responsibilities of municipalities related to the organization of municipal waste separate collection services.

3.7.1 Packaging waste quantities

There are no reliable data about the packaging waste quantities in FBiH.

The estimate prepared is that in 2013 approximately 146,000 tonnes[23] of packaging was placed on the market which corresponds to 66.2 kg per capita. There is no information about the actual distribution of different packaging materials.

The analysis of statistical information, the actually reported quantities of packaging placed on the market and data about municipal waste generation and composition lead to a conclusion that significant amount of packaging is not involved in the EPR system. The expert estimate of the total quantities of undeclared packaging exceed 50%.

The possible reason for this could be the existence of producers and importers of packed goods who neither have signed contracts with PROs, nor pay product taxes to the state. These are usually small companies not completely aware of their responsibilities or afraid that signing a contract with PRO will provoke the Ministry of Environment to impose them penalties retroactively. Despite the fact that such companies exist, they cannot be the reason for such a significant difference in the packaging amounts declared.

[23] The indicated figure refers to the packaging placed on the market in FBiH. The estimate is lower than the estimated quantity of packaging waste as part of recyclable waste. The reason to use more conservative estimated is the fact that the recyclable waste fraction is estimated based on composition analysis data. The samples from the residual waste refer to contaminated materials with high moisture content for some fractions (plastic and paper).

Most probably the lower packaging quantities are a result of fewer amounts declared by the companies already contracted by the recovery organizations. At present, there is no effective mechanism in place to control the quantities declared. The major reasons are:

- The institutions in charge with the control activities are understaffed and do not have the necessary knowledge to check accounting information at the obliged companies;
- The national/entity tax and custom authorities who have access to the information about the sales of individual companies and other accounting data are not involved in the control mechanism;
- The PROs do not audit the quantities declared by their clients, which is the normal practice in other countries. The main reason is that auditing is not supported by the obliged companies and they will prefer to sign contract with PRO not applying such practice.

These obstacles are well recognized by the competent authorities and first corrective measures are already planned.

According to the report "*Solid Waste Management Sector Review and Recommendations on Sector Reform and Investments*", the municipal waste volumes in FBiH are expected to increase by 21% with average annual growth rate of 1.8%. The average waste generation rate is expected to increase from 0.8 kg/cap/day in 2013 to 1.02 kg/cap/day in 2025. Besides waste generation, waste composition will also change as a result of the economic growth of the country. European statistics[24] demonstrate that as income grows, recyclables (mostly packaging) grow 50 percent faster (1.5%x1.8=2.7%/year) than the overall waste growth (1.8%/year) on a per capita basis, while the organic fraction decreases. The following assumptions are made in the report in order to forecast the most probable waste composition:

- Recyclables fraction will grow 50% faster than the overall waste generation per capita.
- Per capita waste generation will grow from 292 to 362 kg/cap/year, which is around 24% increase in 12 years.
- The increase in the recyclable fraction generated per capita, for the same period, will be almost 38%.
- Percentage of generated dry recyclables (plastic, glass, paper, metals, Al. cans, PET) in the total waste is 33% in 2013. The percentage of dry recyclables will increase to 38% in 2025 (133 kg per capita per year).

The Solid Waste Management Strategy for Federation BiH 2008-2018 has set quantitative objectives with specific timetables for realization of strategic goals. According to Strategy the municipal waste collection shall be extended to cover at least 95% of residents and the amount of separated municipal waste shall be increased to 10%. Considering the current baseline (68% collection coverage, almost no separation and recycling, poor basic service level) such transformation of the waste management system in Federation of BiH will require a coordinated effort at all administrative levels, significant development of human resources, increased public participation and significant financial resources. Thus, the implementation of the targets set by the FBiH Solid Waste Management Strategy are considered as a very Optimistic Scenario for the waste management sector in the period up to 2025, also considering the results up to now. The realistic scenario recommended for the future development of municipal waste management in FBiH according to "Solid Waste Management Sector Review and Recommendations on Sector Reform and Investments" assumes:

Increased collection coverage of 100% in urban areas and 60% in rural areas in 2025 (Federal average: 80% in terms of population and 85% in terms of waste generated).

[24] Generation and recycling of packaging waste (CSI 017/WST 002 - Assessment published November 2012

Separation at source of 35% of dry recyclables by 2025 that shall lead to 13% recycling of MSW.

The separation at source will be supported through the established EPR schemes for packaging waste.

The forecasted quantities of generated waste, collected waste and separately collected recyclables are presented in the following table.

Table 3-7: Realistic scenario waste flows (tons/year)

Realistic Scenario	2013	2025
Total Waste	635,640	772,719
Collection coverage	68%	85%
Total waste collected	432,235	656,812
Recyclables	142,638	246,961
Direct collection (10%)	20,976	29,110
Source Separation	Negligible	76,248
Other	116,704	179,967

The quantity of packaging waste is estimated to approximately 70% of the total amount of recyclables and according to above forecast will grow to 203,000 tonnes in 2025.

3.7.2 Recyclable material collection channels

The major collection channels for packaging waste paper and cardboard, plastics, glass and metals allowing the achievement of recycling and recovery targets are presented on the following figure.

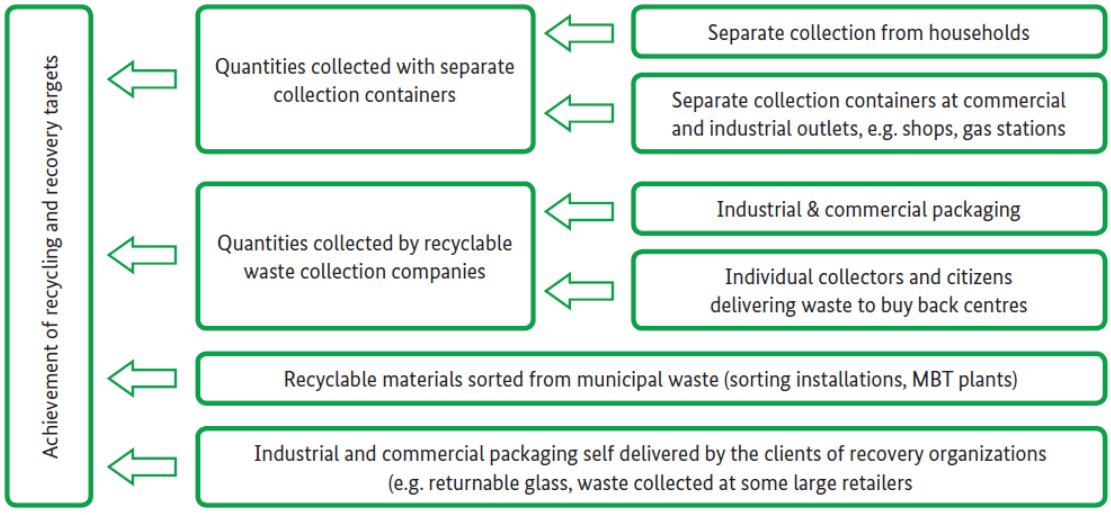

Figure 3-5: Packaging waste collection channels

There are no technical requirements and/or standards for separate collection. Such requirements shall include a definition of the possible types of separate collection system, the type of containers used, minimum container volume provided per capita, collection frequency, maximum number of residents served by container set, materials collected, etc.

There is limited practice for providing of individual bins/containers or use of plastic bags for separate collection. Usually a separate collection bring system using 1.1 m^3 euro containers with wheels is applied. The PROs implemented pilot projects to determine the optimal collection methods.

In parallel to the separate collection with containers, buy-back (recycling) centres operate in the main cities in FBiH. The recyclable waste is delivered to buy-back centres sorted and against payment. The major suppliers of materials are the individual collectors. Most of the buy-back centres operate without proper registration and do not meet the relevant sanitary and hygiene norms.

The role of sorting will grow over the next years, due to the requirement for pre-treatment of waste prior landfilling. Nevertheless, it shall be pointed out that:

- Quality of materials sorted out of mixed waste is very low. This is especially relevant for paper and cardboard waste considering that the paper mills refuse to accept such waste for recycling;
- The legal requirements at European level give a priority to separation at source and sorting of mixed waste will most probably focus on the production of alternative fuels;
- The development of separate collection will reduce the quantity of valuable components into residual waste.

Industrial and commercial packaging self-delivered by the clients of PRO can contribute significantly to the achievement of recycling targets, especially for glass packaging. This is related to the periodic replacement of used returnable glass bottles by large breweries and soft drinks manufactures.

Presently there are no reliable statistical data about how different collection channels contribute to the achievement of recycling targets. Nevertheless it can be concluded that separate collection with containers provides less than 1% of recyclable waste collected, the individual collectors (buy-back centres) bring about 40 - 50% of presently collected paper and plastics, additional 1 - 2% is provided by the sorted municipal waste and the remaining 40-50% is collected industrial and commercial packaging.

3.8 Shortcomings

Over the last years there was a discussion about the results and the efficiency of the established extended producer responsibility system in FBiH. From the formal point of view, the system is achieving the recycling and recovery targets set by the legislation. Nevertheless, almost five years after the start of the system the separate collection of waste at source is not implemented. The achievements over the last years are mainly as a result of the optimization of the collection practices already existing prior the establishment of the EPR scheme and the demand of the recycling industry for raw materials.

The implementation of efficient and cost effective system for the management of packaging waste and WEEE requires substantial changes in the existing legal requirements, organizational set up and operational practices at all levels.

The major issues that need to be addressed with regard to packaging waste management are following:

- The waste management policy documents and the respective legislation adopted at entity level do not provide clear objectives what to be achieved by the EPR schemes with regard to separate collection and recycling. The objectives for organizing separate collection services are not realistic and do not correspond to the recycling and recovery targets for packaging waste. The responsibilities of PUCs to organize collection of WEEE from households are not clear.
- The Federal Solid Waste Strategy will expire in 2018. The Strategy is comprehensive and sets the targets that are, in very general terms, aligned with those of the EU Directives. However, the last 9 years of implementation have revealed that these targets are not achieved and that they should be reconsidered in the following planning period, taking into account the

difficulties in implementation and state of the sector in terms of financial and technical capabilities.

- There is an urgent need to update municipal regulations that guide municipalities and public utility companies in the implementation of their SWM functions while human capacity to do so is low. Enforcement and inspection at all levels need to be strengthened and a clear division of responsibilities between entity and cantonal inspections needs to be introduced. Again, this requires significant human and institutional capacity to do.
- There are no reliable data about the quantity of packaging placed on the market and the amount of recyclable waste separately collected, recycled or exported. The centralized collection of information and database management is still not in place.
- The majority of the packaging placed on the market is not declared by the obliged companies and consequently they do not contribute financially to the collection system (through EPR schemes or Environma Fund). This limits the resources available in the system and does not allow significant improvements in the waste management practices. In addition, the low amount of packaging declared artificially reduces the applicable recycling targets and makes them easily achievable.
- The recycling and recovery targets defined by the legislation for packaging waste are low and their achievement does not present any challenge for the licensed PROs. The recyclable waste from commercial origin and the materials collected by the informal sector are sufficient for the achievement of present recycling targets. The EPR schemes channel the materials already collected and practically do not contribute for an increase of the quantities of waste recycled. In this situation, there is no formal obligation or incentive for the PROs to develop more expensive systems for separate collection of household packaging waste.
- The collection targets for WEEE are low too and far beyond the objectives prescribed by the EU legislation.
- Objectives laid down in WM Strategy concerning separation at source of packaging waste have not been achieved.
- Presently there are no functioning enforcement mechanisms to reduce ‘free riding’ and impose sanctions: i) there is no formal requirement the financial contribution for the packaging waste management to be calculated in the price of goods sold (fees charged by the EPR operator or fees/taxes due to Environmental Protection Fund); ii) there is no clear guidance how the packaging quantities shall be documented and reported by the obliged companies and how the documentation is linked to the accounting systems applied (e.g. fees to be calculated based on sales and accumulated to special account in a similar way like VAT); iii) there is no regular monitoring on the goods placed on marked, identification of obliged companies and inspections of identified companies; iv) the quantities of packaging declared by the companies to the EPR organizations are not subject to audit.
- The permits issued to the EPR organizations do not contain conditions or clear requirements about the separate collection system to be implemented. Usually these include: type of the separate collection system, minimum population coverage, minimum quantities collected, materials collected, minimum container volume installed, collection frequency, required sorting infrastructure.
- One of the major problems in the existing system is the lack of real involvement on behalf of the municipalities. The local authorities are not actively participating in the planning and implementation of the system. The waste management and in particular separate collection and recycling shall become a real priority for the cantonal and municipal administrations.
- There are no clear rules or agreement about the role of cantons and local authorities in the establishment of separate collection systems for recyclable waste on their territories and how these systems shall be financed. These issues are left open and agreed bilaterally between local authorities and PROs on case by case basis.
- There are serious gaps and inconsistencies in the existing legislation with regard to permitting of PRO and their annual reporting. The annual reports of EPR organizations are not subject to independent audit prior submission to the authorities. The annual reports are mainly focused on the achievement of recycling targets and do not provide information about the developments in

the separate collection systems, sorting and recycling infrastructure, communication and awareness campaigns, etc.

- There are no established legal requirements or procedures to divide the responsibilities between the several licensed PROs.
- The capacity of authorities at entity, cantonal and local levels is absolutely not sufficient to implement a proper planning and enforcement of legal requirements. The shortage of staff could be a serious barrier for the improvement of the situation in the future.
- Private sector is not sufficiently involved in the provision of separate collection and sorting services.
- There is obvious lack of public awareness mainly due to lack of public outreach programs to promote waste separation.
- The recycling industry in FBiH is not well developed mainly due to the limited size of the market. In this situation the recycling shall rely on the export of waste which brings additional cost and efforts.
- There is a wrong understanding at the state administration that EPR organizations are managing public funds. There are attempts from the Ministry to regulate and interfere with the actual expenditures of EPR organizations instead of focusing on the practical results to be achieved.
- The management of packaging waste and WEEE shall be considered within the broader frame of municipal waste management. The improvement of separate collection and recycling of packaging waste and WEEE will not be possible without improvements in the overall municipal waste management system.

All these issues will require permanent dialogue and good will from all stakeholders. The trust between the PROs and authorities must be restored and all parties shall contribute for the achievement of the agreed common objectives.

4 CURRENT STATUS OF EXTENDED PRODUCER RESPONSIBILITY IN REPUBLIKA SRPSKA

4.1 Legal framework and policies

4.1.1 General

According to the RS Institute of Statistics[25], the total number of inhabitants in Republika Srpska is 1,170,342 and they live in 57 municipalities and 6 cities. Of that number, 491,581 inhabitants (42%) live in urban areas while 678,761 inhabitants (58%) live in suburban (semi-urban) and rural areas.

Republika Srpska (RS) is one of the entities of Bosnia and Herzegovina, along with the Federation of Bosnia and Herzegovina and the Brčko District. It consists of 57 municipalities and 6 cities[26].

[25] Results of the Census 2013, Cities, municipalities, settlements), RS Institute of Statistic, available at http://www.rzs.rs.ba/front/article/2369/

[26] The Republic of Srpska Institute Statistical Yearbook of Republika Srpska 2016

Figure 4-1: Administrative Organization of RS According to the Dayton Peace Agreement

Environmental protection, including waste management in the RS is the responsibility of the Ministry of Spatial Planning, Civil Engineering and Ecology (MSPCEE).

RS adopted a number of laws and bylaws relevant to environmental protection and waste management:

- The Law on Waste Management ("Official Gazette of Republic Srpska", no. 111/13 and no. 106/15);
- The Law on Environmental Protection ("Official Gazette of the Republic Srpska", no. 71/12 and no. 79/15);
- The Law on Nature Protection ("Official Gazette of the Republic Srpska", no. 20/14);
- The Law on Water ("Official Gazette of the Republic Srpska", no. 50/06, no. 92/09, no. 121/12 and no. 74/17);
- The Law on Air Protection ("Official Gazette of the Republic Srpska", no. 124/11);
- The Law on Communal Activities ("Official Gazette of the Republic Srpska", no. 124/11 and no. 46/17);
- The Law on Communal Police ("Official Gazette of the Republic Srpska", no. 28/13);
- The Law on the Fund and Financing the Environmental Protection ("Official Gazette of the Republic Srpska", no. 117/11, no. 63/14 and no. 90/16);

The Law on Waste Management ("Official Gazette of Republic Srpska", no. 111/13) and the amendments on the Law on Waste Management ("Official Gazette of the Republic Srpska" no. 106/15) regulate:

- type and classification of the waste,
- planning of the waste management,
- the waste management subjects,
- responsibilities and obligations related to the waste management,
- organizing the waste management,
- managing specific waste flows,
- licenses for waste management,
- cross-border waste transportation,
- reporting on waste and the data base,
- financing the waste management,
- supervision, as well as other issues important for waste management.

The aim of the Law is to provide the following:

- waste management in a such way that does not jeopardise human health and the environment,
- prevention of waste generation, in particular by development of cleaner technologies and rational use of natural resources, as well as eliminating the risk of its harmful effects on human health and the environment,
- reuse and recycling of waste, separation of secondary raw materials from waste and use of waste as an energy source,
- development of procedures and methods for waste disposal,
- rehabilitation of unregulated waste disposal dumps,
- monitoring of status of existing and newly established dumping sites, and
- increasing of waste management awareness

The EU List of wastes[27] is introduced through the Rulebook on category, testing and classification of the waste ("Official gazette of the Republic Srpska", no. 19/15).

Other Laws relevant to the waste management in RS are:

- The **Law on Communal Activities** ("Official Gazette of the Republic of Srpska", No. 124/11 and no.100/17).

  This Law determines utility activities of special public interest and the manner of securing special public interest, organization of public utility activities and the manner of their financing. For the purpose of this Law, communal activities of special public interest are: production and supply of water, treatment and disposal of waste water, production and delivery of thermal energy, disposal of waste from residential and commercial premises, management of public spaces for parking vehicles, maintenance of public toilets, management of cable sewers for communication cables and systems, market activity, funeral activities, chimney sweep, public transport of persons in urban and suburban traffic, cleaning public areas on the settlements, maintenance of green and recreational areas, maintenance of public traffic routes in built-up areas, public lighting in urban areas and zoo-hygiene activities.

- The **Law on Environmental Protection** ("Official Gazette of the Republic of Srpska", No. 71/12 and 79/15)

  The Law regulates the protection of the environment in order to preserve it, reduce the risks to the life and health of people, and ensure and improve the quality of life, protection of all

[27] Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of wastes pursuant to Directive 2008/98/EC of the European Parliament and of the Council

elements of the environment, information and access to information in the field of environmental protection, environmental planning and protection, strategic assessment of impacts and environmental impact assessments, procedure for issuing environmental permits and prevention of large-scale accidents, eco-labelling and environmental and environmental management systems, environmental liability, liability for damage to the environment, as well as the rights and obligations of legal and natural persons performing activities defined by this Law.

The main secondary legislation in RS related to packaging waste consists of the following documents:

- The Regulation on the packaging and packaging waste ("Official Gazette of the Republic Srpska", no. 36/15);
- The Regulation on the fee for loading the environment with packaging waste ("Official Gazette of the Republic Srpska", no. 101/12, 38/13, 36/15 and 76/15);
- The Decision on the coefficient for calculating the fee for loading the environment with the packaging waste and the aims for managing packaging and packaging waste for 2017 and 2018 ("Official Gazette of the Republic Srpska", no 23/17);
- The Decision on the coefficient for calculating the fee for loading the environment with the packaging waste and the aims for managing packaging and packaging waste for 2015 and 2016 ("Official Gazette of the Republic Srpska", no. 6/16 and 67/16);
- The Rulebook on the form of the request for issuing licenses for storing, treating and depositing waste ("Official Gazette of the Republic Srpska", no. 18/15);
- The Rulebook on the form of documents for waste transport and guidelines for its appropriate filling ("Official Gazette of the Republic Srpska", no. 21/15);
- The Rulebook on conditions and mode of collecting, transporting, storing and treating the waste used as a secondary material or for generating the energy ("Official Gazette of the Republic Srpska", no. 61/15);
- The Rulebook on content and form of the license for waste management ("Official Gazette of the Republic Srpska", no. 43/15);
- The Rulebook on content, mode of conducting and type of register of licenses issued for waste management ("Official Gazette of the Republic Srpska", no. 43/15);
- The Rulebook on waste lists and documents for cross-border waste transportation ("Official Gazette of the Republic Srpska", no. 86/15);
- The Rulebook on methodology for collecting the data on waste and recording the data ("Official Gazette of the Republic Srpska", no. 71/15);
- The Rulebook on financial guarantees that can ensure the cross-border waste transportation ("Official Gazette of the Republic Srpska", no. 86/13).
-

At present there is no specific regulation in RS governing the management of WEEE.

As is the case with legislation, strategic documents pertaining to environmental protection and waste management are developed at entity level. MSPCEE has drafted WM Strategy for the period from 2017 to 2026 in cooperation with other relevant ministries and departments in charge of environmental protection in local self-government units (cities and municipalities). The RS National Assembly adopted the WM Strategy on July 6, 2017.

The WML allows the development of specific plans for individual waste streams.

Local waste management plan shall be prepared by the unit of the local self-government in charge of environmental affairs in cooperation with other organizational units responsible for economic affairs, finance, spatial planning, as well as representatives of companies, associations, professional institutions, non-governmental and other organizations dealing with environmental protection, including consumer organizations. Two or more local self-government units with a total population of

at least 200,000 inhabitants can prepare a common waste management plan upon obtaining the approval by the Ministry.

The following sections present a short analysis of the main provisions in RS legislation and planning documents with regard the extended producer responsibility for packaging waste and WEEE.

4.1.2 Law on Waste Management (WML)

The key elements of the extended producer responsibility system for packaging waste are introduced in the legislation through the amendments on the Law on Waste Management ("Official Gazette of the Republic Srpska" no. 106/15)

Article 63 of WML provides definition of packaging waste and requires the manufacturers, importers, packers and wholesalers to ensure the proper management of packaging and packaging waste.

A producer of products, after which their packaging waste is generated, is obliged to recycling and recovery targets in proportion to the quantity of packaging placed on the market. The recycling and recovery targets are determined by a special regulation of the Government and presented as percentage by weight of packaging placed on the market for a specified calendar year.

The implementation of these obligations can be achieved either individually or collectively through producer responsibility organization (operator).

The obligations for management of packaging waste shall be deemed to have been executed if:

a) the producer of products has paid a compensation fee to the Fund in accordance with procedures prescribed in the Law,
b) the producer of the product has entered into a contract for the transfer of the obligation to fulfill the prescribed objectives with an operator who holds a permit issued by the Ministry.

The obliged companies that fail to comply with the requirements of the legislation are requested to pay a charge (compensation) for loading the environment with packaging waste. The compensation is calculated according to the type (paper / cardboard, plastic, glass, metal and wood) and quantity of packaging, the purpose of packaging (for single and multiple use) and the fulfilment of the targets for recovery and recycling of packaging waste determined for a particular calendar year.

The obligation to pay the charge appears for the supplier who first places the respective packed product on the market in the Republic of Srpska.

The compensation has three elements: compensation for the general objectives and compensation for the specific objectives and administrative fee.

The first two elements have similar structure and procedures for calculation like in FBiH. In practice they represent a kind of penalty for non-achievement of the general and the material specific recycling and recovery targets for packaging waste.

The administrative fee is paid to the account of public revenues of the budget of the Republic of Srpska and then allocated to the account of the Fund. The revenues from administrative fees in the Fund shall be spent for covering the costs related to reviewing and monitoring of the annual reports on the management of packaging and packaging waste, data management and control of the obliged companies.

The amount of compensation is calculated on the basis of the annual report on the management of packaging and packaging waste, which shall be submitted by the payer of the fee and the operator to the Fund no later than March 31 of the current year for the previous calendar year.

The report shall also provide evidences confirming the accuracy of the data specified in the report.

The Fund shall calculate the compensation based on the annual report and issue a decision on the payment of compensation, ie on the exemption from payment of compensation. The decision on payment of compensation determines the amount of compensation, the manner and the period of payment. By the decision on exemption from payment of compensation, it is established that the PRO or the individual company has fulfilled the prescribed objectives for the management of packaging waste.

The Article 63đ, WML defines the producer responsibility organization (operator) as legal entity that poses a permit issued by the Ministry for the performance of packaging and packaging waste management activities. The operator may perform its activities directly or or through authorized subcontractors.

The permit of PRO is limited to the period of five years.

The content of the application and the special conditions for granting the permit for the operator are determined in the special regulation.

The procedures for calculation of fees and the duties of the obliged companies are clearly described in the legislation.

Similar to the situation in FBiH, the payment of fee to the Fund in RS is considered equivalent to the signing of contract with a PRO.

The WML does not contain specific provisions for extended producer responsibility system for WEEE.

WEEE is considered as special waste stream together with spent batteries and accumulators, waste oils, waste tires and end-of-life vehicles.

Article 84, WML allows the introduction of compensation (product tax) due by the producers or importers of products that after their final use become special waste streams. Such taxes/fees shall be paid to the account of public revenues of the budget of the Republic, allocated to the account of the Fund and shall be used for the investment and operational costs of managing special waste streams through the Fund in accordance with this Law and a special regulation.

The RS Government shall adopt a decree determining products that become special waste streams after use, a form of daily records on the quantity and type of manufactured and imported products and annual reports, the manner and deadlines for submitting the annual report, the responsibilities of the obliged companies, the criteria for calculation, the amount, the procedures and the manner of charging and paying the taxes/fees.

Some requirements for the management of WEEE are provided in Article 55 of WML, including ban on mixing with other types of waste, ban on disposal of WEEE without prior treatment, requirement for separation and adequate disposal of PCB containing components, identification of recyclable components of the product, etc.

The person who collects, treats or disposes of waste from electrical and electronic products must have a permit, keep a record of the quantity and type of electrical or electronic products taken over, and submit the data to the Fund.

The Ministry shall issue a rulebook prescribing a list of electrical and electronic products, prohibiting measures and restrictions on the use of electrical and electronic equipment containing hazardous substances, the manner and procedure for management of WEEE.

The establishment of EPR system for WEEE in RS will require substantial amendments of the WML in a similar way like it was done for packaging waste.

4.1.3 Specific requirements for the management of packaging and packaging waste

In addition to the provisions contained in WML, the requirements for the management of packaging waste in the RS are defined in the Regulation on Packaging and Packaging Waste ("Official Gazette of the Republika Srpska", no. 36/15), which to a great extend is harmonized with the Directive 2004/12/EC of the European Parliament and Council of 11 February 2004 that amends Directive 94/62/EC on packaging and packaging waste (OJ L 047 18/02/2004).

Some specific provisions are also enacted is the Regulation on charges for loading packaging waste to environment ("Official Gazette of the Republic Srpska", no. 101/12) and the Regulation on amendments to the Regulation on charges for loading packaging waste to environment ("Official Gazette of the Republika Srpska", no. 76/15).

The Regulation on the management of packaging and packaging waste (RPPW) establishes common definitions and lays down rules for:

- Packaging design and production with regard to waste prevention, re-use and recycling
- Maximum allowed content of heavy metals like lead, cadmium, mercury and hexavalent chromium
- system of classification and labelling of packaging materials
- division of responsibilities of all economic entities in accordance with the "polluter pays" principle and the principle of extended producer responsibility throughout the entire life cycle of packaging
- general and material specific targets for recycling and recovery of packaging waste
- requirements for the scope and content of the application for a permit for producer responsibility organization (operator) and for the companies intending to implement their duties individually
- specific responsibilities of the producer responsibility organization
- requirements for regular take-over and collection of packaging waste which is not municipal waste from end-users
- specific requirements for biodegradable packaging intended for composting or biodegradation

The following provisions require specific attention with regard to extended producer responsibility system implemented in RS.

PRO legal form and ownership

According to Article 19, the PRO is a legal entity authorized by the Ministry for the performance of packaging and packaging waste management activities.

The Regulation imposes limitations on the possible founders/shareholders of PRO and they are limited to legal entities whose core business activity is the placing of packed goods on the market in RS (i.e. waste management companies, recycling plants and private entrepreneurs are excluded).

There is a formal requirement the PRO to operate on non-for-profit basis, considering that all its profits shall be invested in the construction of a waste management infrastructure.

Equal treatment of all EPR scheme members is also required and charging of different fees to the founders and clients of PRO is not allowed.

Permitting of PRO activities

The PRO shall comply with the following conditions:

- to be registered for carrying out waste management activities in accordance with the regulations governing the registration of economic entities.
- dispose of individually or through subcontractors the necessary equipment, plants and devices to implement the packaging waste management system, and
- provide conditions for recovery, recycling or disposal of packaging waste

In order to obtain a permit the PRO shall submit an application, including:

- evidences about the compliance with the above conditions
- packaging waste management plan,
- presentation of a packaging symbol, if it is intended to be used for designation of packaging included in the packaging waste management system,
- contracts or pre-contracts with at least ten entities that have transferred their packaging waste management obligations to operators and put at least 8 000 t of packaging per year on the market.
- contracts or pre-contracts with subcontractors who are authorized collectors or recyclers for all types of packaging materials (plastics, paper, cardboard, metal, glass, wood, multilayer materials, etc.) and
- proof of ownership of a business premises or lease of business premises,
- certified copies of higher education diplomas for personnel and
- proof of employee registration

The packaging waste management plan shall contain information about:

- type of packaging for which the PRO intends to organize waste management system,
- the producers, importers, packers, fillers who have transferred their obligations
- the manner and frequency of the takeover of communal packaging waste from utility companies,
- organization of the collection points for packaging waste other than household waste; the manner and frequency of taking this waste from the place of generation,
- the number and location of the collection sites that the PRO intends to organize,
- type and capacity of equipment, plants and devices for collection, collection, temporary storage, sorting of waste, owned by the PRO or engaged through subcontractors, or other activities that provide for recycling, recovery or disposal,
- the estimated mass of packaging waste to be collected during the year and the weight of packaging materials that must be recycled, in accordance with the recycling and recovery targets defined in the legislation.
- the methods envisaged and subcontractors that provide for the reuse, recycling or disposal of collected packaging waste, and
- the anticipated amount of processed packaging waste, as well as the quantity of raw materials in processed and recycled packaging waste in accordance with the recycling and recovery targets defined in the legislation.

The above requirements for the obtaining of permit are usual and similar to those applied in other countries.

The missing element is the public education and awareness programme. Such requirement for provision of information exists but it’s not part of the application for a permit.

Contracts with local authorities could also be required.

It's not clear whether the PRO shall submit to the Ministry detailed cost estimates for the proposed packaging waste management system, financing plan and indicative service tariffs.

Competitive operation of several PRO

There is no requirement that only one PRO can operate on the market at the entity level.

Nevertheless, the requirement for the availability of preliminary contracts with at least ten entities that have transferred their packaging waste management obligations and put on the market at least 8 000 t of packaging per year is a practical limitation of the possible number of PRO. Considering that RS is a very small market the existence of such limitation shall be supported.

Organizing the separate collection, sorting and recycling of packaging waste

The PRO shall organize centers for the collection, sorting and temporary storage of collected packaging waste, taking into account the population density, the quantity of household packaging waste, the arrangements for collection of commercial packaging, the distances to the final processing plants, etc. The PRO may perform these activities individually or through authorized subcontractors.

Despite that the Regulation allows the PRO to perform separate waste collection, sorting and treatment of packaging waste, the implementation of such approach is not advisable because it can lead to a serious distortions of competition and direct impact on the activities of the existing small and medium enterprises dealing with collection of recyclable waste.

The lack of clear technical requirements towards the separate collection and sorting system to be implemented can be considered as a deficiency of the regulation. Such requirements can be provided as a separate guidance document, included in the waste management plan prepared by PRO or established as a condition in the permit.

There is no formal requirement for obligatory separation at source of packaging waste generated at large commercial sites and administrative premises.

The Regulation does not precisely define the responsibilities of the local authorities for the organizing of separate collection of packaging waste on their territories and how to formalize the relations and division of responsibilities between the PRO and the local authorities.

The requirement PRO to take over the packaging waste collected from communal companies presume that the separate collection will be organized by the local authorities.

Documentation and reporting requirements

The obliged companies (manufacturer, importer, packer, filler, etc.) are required by 31 March of the current year, to submit to the Fund a report on the management of packaging waste for the previous calendar year, as well as evidences confirming the accuracy of the data specified in the report.

The report template is provided as an Annex to the Regulation and contains detailed data about the quantities and type of packaging placed on the market, imported and exported to other countries, the amount of packaging contracted to PRO, the amounts of packaging waste collected, recycled and recovered per type of material and recovery operation. The report also contains data about the reusable packaging.

In addition to the report, a packaging specification shall also be submitted specially containing information on the weight of the product and the weight of the packaging in which the product is packed, and the type, weight and percentage share of the packaging material per package.

Such packaging specification shall be considered as valuable tool for calculation of packaging quantities.

The PRO is also obliged to submit an annual report according to separate template defined in the Regulation. The report contains detailed information about the obliged companies that transferred their responsibilities to PRO, the types and quantities of packaging represented by the organization and the amounts of packaging waste recycled and recovered. The data about the packaging waste separately collected shall be reported separately for household (communal) and commercial packaging (other sources).

It shall be noted that the reporting templates applied in RS are more detailed than those applied in FBiH. It's also important to mention that the annual reports of the obliged companies contain information for the packaging quantities placed on the market not only in RS but also in the FBiH and in the District of Brcko. It can be beneficial for the entire system if the authorities in FBiH decide to use a similar template and unify the reporting requirements.

Penalty provisions

In case that the PRO fails to achieve the recycling and recovery targets prescribed in the legislation, it shall pay to the Fund the total amount of compensation, calculated for each contracted company who transferred the obligation to manage the packaging waste.

Inspection supervision over the application of the provisions of this Regulation shall be performed by the inspection in charge of environmental protection - environmental inspection and market inspection of the Republic Administration for inspections and inspectors of local self-government units.

The fines applicable to the obliged companies that are envisaged in the Regulation are adequately covering the possible offences.

Fees for not achieving recycling and recovery targets

According to calculation formulas provided in Article 6 of the Regulation on the fee for loading the environment with packaging waste ("Official Gazette of the Republic Srpska", no. 101/12, 38/13, 36/15 and 76/15), the fees practically present a penalty for not achievement of general and material specific recovery and recycling targets. It's calculated by multiplying a coefficient to the difference between the target quantity and the actually recovered/recycled quantities. The coefficient structure and size is same like in the FBiH.

Table 4-1: Packaging fee coefficients in RS

Target type	Coefficient	Coefficient Value BAM/kg
Administrative fee	Ke	0,002
General recycling and recovery target	K	
Material specific recycling target	K_R glass	0,40
	K_R metal	0,30
	K_R paper	0,40
	K_R plastic	0,60

	K_R wood	0,25
	K_R composite and other	0,60
	K_R packaging containing hazardous substances	5,00

The indicative fee per tonne of packaging is presented in the following table:

Table 4-2: Calculation of packaging fees in BAM/tonne

	Fee coefficient	Fee for general recycling targets		Fee for material specific targets		Administrative fee	Total Fee (general + specific + Administrative
Plastics	600,00	35%	210,00	16%	96,00	2,00	308,00
Glass	400,00	35%	140,00	12%	48,00	2,00	190,00
Metal	300,00	35%	105,00	10%	30,00	2,00	137,00
Paper and cardboard	400,00	35%	140,00	30%	120,00	2,00	262,00
Wood	250,00	35%	87,50	12%	30,00	2,00	119,50
Other	600,00	35%	210,00	10%	60,00	2,00	272,00

Regarding fee calculation and payment mechanism, the following observations can be done:

- The procedure for calculation and payment of fees is relatively well defined
- There is no formal requirement the fees to be calculated in the price of goods sold.
- The differences in the estimates of the fees per tonne for the different materials are not significant and do not correspond to the different separate collection costs for the different materials (i.e. cross subsidies between the different packaging materials shall be expected)

With the exemption of administrative component of the fee there are no clear rules how the spending shall be organized:

- Financing of separate collection equipment and infrastructure like containers and collection vehicles
- Financing the operating costs for separate collection and sorting
- Payments per tonne of separately collected packaging waste
- Cost sharing in case that same facilities are used for collection of non-packaging materials (e.g. printing paper)
- How to guarantee that the funds spend are not subsidizing other municipal activities
- Tendering of services
- Financing of recycling infrastructure

Similar to the FBiH the fees that are due to the Fund are paid annually and such obligation is unlikely to be enforced efficiently.

A product tax with monthly payments can be a more practical solution. The members of PRO shall be exempted from the obligation to pay a product tax (except the administrative component of the fee). The administrative component of the fee shall be paid by the PRO on behalf of all contracted companies.

4.1.4 Waste Management Strategy

The WM Strategy for RS is a fundamental document that assesses the state of waste management, determines long-term goals for waste management and provides conditions for rational and sustainable waste management in the RS.

The WM Strategy:

- Establishes a framework for sustainable waste management in the coming period which implies reducing the amount of waste produced, and sustainable management of produced waste
- Directs activities towards the process of passing laws and regulations to EU
- Determines responsibility for waste
- Sets short-term and long-term waste management goals and measures and guidelines for achieving the set goals
- Determines financing measures for establishing a waste management system.

The establishment of a waste management system, which includes the appropriate collection, transport and treatment/disposal of different types of waste is to be directed and planned for the conservation of natural resources and in line with the fundamental principles contained in EU legislation:

- The principle of selecting the most suitable option for the environment,
- The principle of proximity and a common approach to waste management,
- The principle of waste management hierarchy,
- The principle of accountability,
- The principle of regionalization, and
- The principle of "polluter pays".

The objective of the WM Strategy is:

- Adoption of by-laws that would regulate in detail the management of all categories of waste in RS,
- Compliance of legislation of the RS with EU legislation, taking into account the strategic commitment of RS,
- The establishment of an information system for collecting data on waste quantities,
- Development of a sustainable waste management system based on the principles of environmental protection with the implementation of education at all levels of society and the economy,
- Increasing the household coverage through waste collection services,
- Increasing separate collection of waste and recycling,
- Remediation of the existing official and illegal dumps,
- Remediation of "black spots",
- Construction of adequate facilities for the treatment/disposal of waste.

Complete coverage the population by organised municipal waste collection service is expected by the year 2026, the growth of separately collected municipal waste for recycling, as well as treated municipal waste should increase significantly by 2026 (Table 3-2).

Table 4-3: Targets for waste amounts in %

Goals	2017	2021	2026
Population covered by organised collection of municipal waste	73	85	100

The amount of separately collected and recycled municipal waste	3	8	23
The amount of treated waste	0.4	2	8

The Strategy defines the development of separate collection system for municipal waste as short term priority. It shall be implemented through organizing green islands and waste collection in all units of local self-government, and it should be possible to collect directly from waste producers or other applicable systems. The basic precondition is the equipping of local self-government units with utility equipment in order to establish an efficient system of separate collection of waste.

It is necessary to establish an efficient system for the management of separately collected packaging waste with the financial support of the state, increase the percentage of separate collection of waste for recycling, and at the entity level reach 8% by 2021.

In a long-term, by 2026 the separate collection system shall achieve recycling of approximately 50% of paper and cardboard, plastics, glass and metals contained in the municipal waste.

4.1.5 Legislation at municipal level

At municipal level, management of MSW is regulated through Decisions on communal order which define the rights and obligations of inhabitants, municipal utilities and other actors involved in maintenance of communal hygiene, public order, maintaining of public green areas and public traffic lanes, public lighting, other municipal facilities and collection and disposal of MSW. Households and legal entities pay to the utilities for waste management services.

4.2 Institutional framework

4.2.1 Entity level

In the Ministry of Spatial Planning, Civil Engineering and Ecology (MSPCEE) of RS the activities pertaining to waste management, including the issuance of waste management permits are carried out within the Sector for Environmental Protection. The Sector for Environmental Protection is responsible for, inter alia, drafting of laws and by-laws pertaining to environmental protection; contact and coordination with domestic and international competent authorities for environmental protection; and participation in the implementation of projects financed by international financial organisations falling under environmental protection.

Similar to FBiH, municipalities in RS are regulated by the Law on Utility Services (O.G. of RS, No. 124/11) and the Law on Local Self-Government (O.G. of RS, No.97/16). Local governments are obliged, inter alia, to regulate and ensure the provision of utility services (including waste management). Local self-government (municipal government), in accordance with the Law, organises the waste collection and disposal services. In essence, municipalities adopt Decisions on utility services which regulate the delivery and maintenance of utility services within their borders (including collection and disposal of municipal waste).

In RS, as in FBiH, the system of public administration is still often directly involved in solid waste management. Municipalities are responsible for the development of municipal waste management plans and the organisation of waste collection and disposal activities.

Local governments are obliged to prepare and propose a development program, adopt and implement local waste management plans, regulate and ensure the provision of communal services and their development, organise management of municipal waste and non-hazardous waste arising within its territory, provide funding for duties within their competence, and develop and manage tenders and contracts for the utilities.

Municipal departments for urban planning and utility affairs are responsible for waste management planning. Through these divisions municipalities engage utility companies to perform certain tasks in waste management at the municipal level (municipality may establish a public utility company or these tasks may be entrusted to private companies). Waste management services are mainly carried out by utility companies (which are fully or partly state-owned).

In RS, in line with the Law on Waste Management, the Environmental Protection and Energy Efficiency Fund of RS is responsible for maintaining and updating the waste data base in RS.

The brief description of the roles and responsibilities of MSPCEE, municipalities and other key institutions are given below.

Ministry of Spatial Planning, Civil Engineering and Ecology (MSPCEE)

The Government of RS through the Ministry of Spatial Planning, Civil Engineering and Ecology (MSPCEE) is responsible for waste management.

The MSPCEE has in the following organizational units:

- Office of the Minister
- Department for Urban and Physical Planning
- Department for Construction
- Department for Environmental Protection
- Department for Projects Coordination, Development and European Integration
- Secretariat

Two employees are dealing with waste management in MSPCEE, two with environmental permits, and two with legislation and policy development.

MSPCEE is responsible for, inter alia:

- Policy development
- Waste management;
- Ecological protection of air, water, and soil;
- Development of environmental protection strategies and policies;
- Air, water, and soil quality standards;
- Ecological monitoring and control of air, water, and soil.

MSPCEE has the authority to:

- Prepare the Strategy in cooperation with the competent authorities,
- Propose to the Government individual waste management plans,
- Monitor the situation, coordinate and perform waste management activities of importance for the RS,
- Give permission to local governments for preparation of joint waste management plans,
- Issue permits, approvals and other documents stipulated by this law and
- Establishes an authorised organization in accordance with this law.

MSPCEE has prepared the WM Strategy in cooperation with other relevant ministries and departments in charge of environmental protection in local self-administration units. The Strategy has been adopted by the National Assembly upon the proposal of the Government of the Republika Srpska, for a period of ten years.

Fund for Environmental Protection and Energy Efficiency of the RS

The Fund for Environmental Protection and Energy Efficiency of the RS performs tasks related to:

- The collection of fees for management of special waste streams,
- The provision of services for the collection and treatment of waste and coordination of stakeholders of waste management systems, unless otherwise regulated by a special regulation,
- Collection of information,
- Managing and updating the database on waste management,
- Keeping track and updating date on quantities of waste, including secondary raw materials, sharing and making available such data by electronic means,
- Reporting on waste management to MSPCEE and the Assembly of RS,
- Financing for the preparation, implementation and development of programs, projects and similar activities in the field of conservation, sustainable use, protection and improvement of the environment, and energy efficiency and use of renewable energy sources in accordance with special regulations,
- Managing and controlling of EPR scheme, and
- Other tasks determined by special regulations.

Administrative supervision, supervision over the legality of work and by-laws of the Fund is performed by the MSPCEE.

According to Article 86 WML, dedicated funds referred to in Article 85 of WML shall be used for:

- construction of a waste management facility,
- improvement of waste management organization,
- management of spent batteries and accumulators, waste oils, waste tires, waste from electrical and electronic products, waste from fluorescent tubes containing live, waste vehicles and medical waste,
- encouraging separate collection of waste,
- stimulating the market for recycled materials,
- implementation of entity and local waste management plans,
- development of an information system for waste management,
- assistance in the development and application of new technologies for the treatment of waste,
- remediation of long-term waste pollution,
- education programs and public awareness raising on environmental and waste management issues and
- financing other costs, in accordance with the law.

The Republic Administration for Inspection Affairs - the Republic of Srpska Inspectorate

The Republic of Srpska Inspectorate consists of 13 inspectorates, of which the Urban Planning, Construction and Environment Inspection Service monitors the implementation of regulations in the areas of urbanism, civil engineering and environmental protection.

The Republic of Srpska Inspectorate is an independent republic authority which deals with administrative works of general importance for the Republic of Srpska. The role of the Inspectorate is to, by conducting inspection, administrative, expert and other activities, encourage social discipline in following laws and other regulations. The surveillance of the work of the Inspectorate is conducted by Republic of Srpska Government, and the Inspectorate submits reports to the Government annually.

The Republic of Srpska Inspectorate is organized following the functional principle with inspection sectors as its basic units, and for the sake of efficient and direct performance of inspection surveillance on the Republic of Srpska territory, alongside the administration in Banja Luka, six more Regional Departments were formed located in Banja Luka, Prijedor, Doboj, Bijeljina, East Sarajevo and Trebinje.

The Republic Urban Planning, Construction and Environmental Inspection Service conducts inspection surveillance concerning compliance with the regulations referring to spatial planning and maintenance, building and construction, construction materials, environmental protection, ecology, waste management and other administrative areas is so regulated.

In connection with waste management, the Republic Urban Planning, Construction and Environment Inspection Service controls:

- subjects which are polluters and which have to possess the environmental licence;
- compliance with conditions for the work of companies dealing with environmental protection;
- managing of legal landfills, and
- other requirements prescribed by the law.

The Republic of Srpska Institute of Statistics

The Republic of Srpska Institute of Statistics is the administrative organisation given the main task to produce official statistics for all categories of users, the government and other authorities, systems, scientific institutions, the media, the general public and individuals. The Institute is in charge for preparation, collection, storing, processing, compilation, analysis and distribution of statistical data. RS Institute for Statistics is collects waste related data from public utility companies, regional landfills and industries for statistical purposes and reports to the Agency for Statistics of BiH and EUROSTAT including data on amount of waste generated, collected and disposed. The data is collected on a random sample through questionnaires.

It is important to emphasize that RS Institute for Statistic in line with Law on Statistic of RS (Official Gazzete 85-03) send the reports to the Agency of Statistics BIH, but there's no jurisdiction to report the EUROSTAT or other international institutions, which is in strict legal jurisdiction of the State Agency for statistics

The Fund for Environmental Protection and Energy Efficiency of the RS conducts collection of waste data independently from the Republic of Srpska Institute of Statistics.

4.2.2 Local level

Local self-administration units

Local self-administration units (in charge of the provision of waste management services) are obliged to:

- adopt the local waste management plan and joint waste management plan, ensure the conditions and take care of their implementation,
- regulate, provide, organise and conduct municipal waste management on their territory, in accordance with special regulations,
- regulate the process of collection services in the field of municipal waste management in accordance with special regulations,
- approve tariffs proposed by the utility companies,
- provide funding for duties within their competence, and
- develop and manage tenders and contracts for the utility services.

The local self-government unit by its act determines bodies and services responsible for conducting these operations. Assembly of two or more local self-government units with at least 200,000 inhabitants, upon obtained agreement from the Ministry, adopt a waste management plan in accordance with the

Strategy. The process of adoption of waste management plan shall be regulated by agreement signed by local self-government units. The agreement regulates: mutual rights and obligations in providing conditions for the activities and operation of waste management facilities in the areas of the local self-government units; rights and obligations of the public utility, or any other natural or legal person for the performance of these activities; decision-making in the event of disagreement between local self-government units on specific issues relating to waste management activities, as well as other issues of importance for the organisation and implementation of waste management. The agreement is concluded by the principal or mayor of the local self-government unit with the prior consent of the assembly of the local self-government unit. In the event that two or more local self-government units conclude an agreement on joint waste disposal or collection, they are obliged to transport collected waste in their area to a common landfill.

Municipal enterprises

Municipal enterprises, public or private, provide waste management services (collection of municipal waste from households and other sources that produce waste, treatment of municipal waste and management of sites for separate waste collection).

Other stakeholders in municipal waste management are manufacturers or importers of products that become waste after use, the owners of the waste, i.e. waste producers, waste transporters and operators of facilities for waste collection, waste treatment and landfill operators.

Private Sector

Private sector involvement in waste management is rather limited and is related to recycling and recovery of waste and waste collection from private companies. Only two collection companies with majority private ownership collect municipal waste in cities Banja Luka and Doboj. In other municipalities, majority owners of collection companies are municipalities. According to the Law on Waste Management private companies can obtain licenses to become operators and perform waste management services including collection services, gathering, storage, treatment or disposal of wastes. Municipalities sign contract with collection companies after conducted public procurement procedure. The duration of the contract is three to four years.

4.3 Service provision and infrastructure

4.3.1 General overview of municipal waste management in RS

The average MSW generation per capita in the Waste Management Strategy for period 2017-2026 is estimated to 0.86 kg/day on average. This figure has to be revised due to acceptance of final census data for 2013. For planning purposes, the MSW generation in urban areas is estimated to 1.05 kg/capita/day and 0.55 kg/capita/day in rural areas that corresponds to an average generation rate of 0.76 kg/capita/day.

It is calculated that in RS 1,170,342 inhabitants produce around 324,660 tons of waste in 2013 with approximately 58% being generated in urban and 42% in rural areas.

The amount of recyclable waste fraction in MSW is estimated based on data from waste composition surveys held in different cities. The composition analysis data show that the amount of dry recyclables (plastic, glass, paper/cardboard, cans, PET, foil, metals) is 23% in Prijedor, 30% in Bijeljina and 45% in the samples taken at the regional landfill in Banja Luka. The percentage is lower in rural municipalities and higher in the urban areas.

The collection of mixed municipal waste follows the same practices as described for the FBiH.

Collection and disposal of municipal waste is the responsibility of the local government, in accordance with municipal Decisions on Utility Services. Out of 62 municipalities in RS, organised municipal waste collection and disposal is carried out in 59 municipalities. In 3 very small rural municipalities - that is, Istočni Mostar, Kupres and Istočni Drvar - the waste collection and disposal services are not carried out regularly, and the utility companies from neighbouring municipalities are contacted by the municipal authorities as and when waste collection services required.[28]

The waste collection services are provided by approximately 61 companies including a limited number of private companies in association with the municipality (Banja Luka, Doboj). Some small private companies are collecting mainly dry recyclables directly from the commercial/institutional sector. The legal status of most of the waste collection companies is a closed joint stock company (A.D.) in which the municipality is normally the sole shareholder or in some cases together with a private company (Banja Luka, Doboj).

In addition to waste collection and transport services the waste collection company can also be engaged by the municipality against payment for street cleaning, snow cleaning, green areas/parks maintenance, maintenance of infrastructure, water supply, etc. These services are organizationally and financially not always clearly divided from waste collection and disposal services. This hampers in many cases clear cost control for waste management services. In practise the income from other services could compensate the losses in the field of SWM.

The level of waste collection services is highest in the municipalities of Istočno Novo Sarajevo (89%), Mrkonjić Grad (72%) and Gradiška (72%), whereas the level of waste collection services is particularly low in the municipalities of Osmaci (11%), Kalinovik (13%), Ribnik (15%) i Berkovići (14%)).[29]

The waste collection system for households can be a mix of (i) bags delivery; (ii) the use of containers of 120/240 litres mainly for door-to door collection and (iii) the use of communal containers of 1,100 litres i.e. bring system being the overarching system. In addition 5-7 m³ skips are used mainly for the commercial/institutional/industrial sector. Collection equipment consists of compactor trucks (5-24m³), skip loaders, dump trucks, tractor- trailer combination, and flatbed trucks. The main part of the collection trucks i.e. approximately 60% is older than 10 years.

The current situation with municipal waste management can be described as follows:

- The number of inhabitants served would be approximately 68.5% (outside Banja Luka) and 84% in Banja Luka (2013 population census).
- Doubts exist about the reliability of waste quantities collected, as municipal landfills have no weighing scales. Weighing scales are only available at regional landfills. Loads are estimated on basis of truck volumes and assumed densities. The companies report a total collected waste quantity in 2015 of 102,366 tons. This would result in an average waste generation rate of approximately 0.94 kg/cap/day.

[28] Source of information: Environmental Protection and Energy Efficiency Fund of RS, International Association of Scientists AIS - Banja Luka and Institute of Geography and Regional Research of the University of Graz–Austria (2013) *Waste Management in Republika Srpska - Analysis of Current Situationwith Special Focus on Utility Companies*

[29] Source of information on the level of coverage: Environmental Protection and Energy Efficiency Fund of RS, International Association of Scientists AIS - Banja Luka and Institute of Geography and Regional Research of the University of Graz–Austria (2013) *Waste Management in Republika Srpska - Analysis of Current Situation with Special Focus on Utility Companies*

- Waste separation is hardly carried out by the municipalities. The total quantity of separately collected waste reported in 2015 is 1,179 tons/year approximately 1.6% of the total collected waste quantity i.e. 2% in Banja Luka and 1.2% outside Banja Luka. Dry recyclables (paper, plastics) are also collected by small private companies directly from the CII sector and by the informal sector taking it out of the containers.
- The waste collection companies are responsible for concluding contracts with the waste generators (households and CII entities) and for the collection of the tariffs. Thereto they employ tariff collectors especially for non-payers and extra administrative staff resulting in extra costs and risks.
- Various calculation methodologies are used to establish the tariffs and consequently the tariff varies between the municipalities. Tariffs might be based on m² usable surface, fixed amount per person per household, fixed amount per household, number of waste removals, etc. The weighted average tariff/year for the served inhabitants is BAM 128/hh/year (based on 75m² usable area) or BAM 142/ton (incl. VAT) based on 3.09 persons /household and 0.8kg/cap/day waste generation. The average spendable income of the households in 2013 was approximately BAM 1,672/month. It can be concluded that the average tariff for waste management was 0.64% of the spendable income, while international norms indicate 1-1.5%. The average tariff collection rate is 82% and it is doubtful if this percentage could be improved as approximately 18% of the population lives below national poverty line ($ 460/month or BAM 850/month).
- Proposals for new tariffs each year are prepared by the waste collector on basis of the costs of last year and any cost developments. The calculations are checked by the Municipal Department for Communal Affairs and subsequently submitted to the City Council for approval. However, in many cases the tariffs have not been increased since many years and the political will to increase the tariffs is rather low.
- Tariffs for household type waste from the commercial and institutional sector are substantially higher than for households. In general, these tariffs are also based on m² and the amount depends on the type of activity.
- Tariffs are considered to be low; contracting and tariff payment system is problematic. Enforcement is weak.
- There are 4 regional landfills operational in RS i.e. Bijeljina, Banja Luka, Prijedor and Zvornik servicing in total 23 municipalities including 5 municipalities from FBiH. These regional landfills serve a total of 716,715 inhabitants in RS (64% of total population). There is non-sanitary RL in Doboj serving 6 municipalities including 4 municipalities from FBiH. In addition 22 non-sanitary single municipal landfills and more than 200 dump sites receive municipal waste.
- Not all municipalities adhere to signed agreement for disposing at regional landfills and apparently, there is no enforcement.
- In case of regional or inter-municipal landfills the municipalities have to pay a gate fee (Banja Luka: BAM 28/ton; Bijeljina BAM 34/ton; Zvornik: BAM 39/ton; Prijedor: BAM 20/ton excl. VAT), which normally includes both operational and amortization costs. The gate fees at regional landfills seems to be low and do not guarantee the long-term sustainable operation of the facilities.
- Landfill amortization costs in case of disposing at non-sanitary municipal landfills are not taken into account i.e. only operational costs are included in the overall costs.
- Companies are not carrying out any communication/public awareness raising activity (no budget, no specialised staff). Staff training is not being carried out.
- The municipality might subsidize directly the waste collection company by taking over payments wholly or partly for operations. The Environmental Fund can make available grants for investments and the EPR system can provide payments for containers and/or public awareness raising activities to increase separation of packaging waste in case the municipality has a contract with the EPR scheme.

The existing waste management set-up for both waste collection and disposal is inadequate in most municipalities. Main challenges facing the current waste management system and its operations are:

- Having a significant number of residents living in rural areas without waste collection services leads inevitably to uncontrolled dumping of waste;
- The number of uncontrolled landfills and dumpsites is high;
- Facilities do not conform to recent technical standards and thereby pose a risk for human health and the environment;
- Separate collection and sorting of recyclable waste is undeveloped, composting and anaerobic digestion of bio-waste is not practiced and there is no pre-treatment of residual mixed waste prior to landfill;
- Whereas tariffs set for waste collection approach their full-cost recovery levels, those for disposal are very low and fail to provide the financial incentives needed to motivate acceptable disposal practice. Tariffs will need to rise considerably before the minimum standards of international good practice can be met;
- Low levels of cost recovery from users make service providers reliant on budget transfers from municipal and central government funds;
- Legislation is fragmented, with regulatory provisions distributed across a number of legal acts.
- Control over waste disposal operations is weak and mechanisms to enforce legal compliance are only poorly developed and implemented;
- Public administrations responsible for the municipal waste sector do not have the resources needed to manage modern and increasingly complex systems;
- Current institutional arrangements do not support the involvement of the private sector and create unnecessary barriers to attracting investment;
- Poorly developed arrangements for inter-municipal cooperation are an obstacle to the creation of modern waste treatment and disposal infrastructure; and
- People generally are poorly informed on all aspects of modern municipal waste management.

4.3.2 Separation at source and separate collection of municipal waste

Based on data from the Ministry of Spatial Planning, Construction Engineering and Ecology, 39 private companies in RS have been authorised for waste management activities (out of which, 16 have been authorised for recycling of specific waste streams).

In 19 out of 62 municipalities in RS, there is some waste sorting and recycling activity. Waste is separated manually using obsolete machinery such as cranes, presses for waste, machines for stripping etc. It is reported that only a small number of these centres meet the criteria of the European Union in terms of health and safety standards.[30]

Separation at source is in its infancy. The WM Strategy estimates that only 0.8% is separated from the municipal waste stream. This volume is estimated in the WM Strategy at 1,648 tons. In addition, there is packaging waste not entering the municipal waste stream as small companies directly collect it from the CII sector. WM Strategy estimates this quantity at 21,659 tons of which about 7,000 tons was collected through the EPR system. In the RS only one sorting line for pre-separated dry recyclables is located in Doboj, while a simple, low capacity line (1.5t/h) is planned to be installed soon at the landfill in Banja Luka. The sorting line in Doboj has (temporarily) stopped its operations due to the high financial costs.

[30]Environmental Protection and Energy Efficiency Fund of RS, International Association of Scientists AIS - Banja Luka and Institute of Geography and Regional Research of the University of Graz–Austria (2013) *Waste Management in Republika Srpska - Analysis of Current Situation with Special Focus on Utility Companies*

Figure 4-2: Municipal Waste Recycling Centre PUC Progres Doboj
(Source: PUC Progres Doboj)

The separate collection of household recyclable waste, including packaging waste is practically not implemented. The RS legislation does not provide a clear guidance on responsibilities of municipalities related to the organization of municipal waste separate collection services and obviously these activities are not a priority for the local authorities.

Limited numbers of separate collection containers are installed in Banja Luka.

The contribution of municipal waste sorting to the recycled quantities in RS is also not significant.

The real recycling activities in RS are organized independently from the municipal waste collection services and operate entirely on commercial basis. Private companies collect and trade with recyclable waste commodities and following some limited preparations and processing the collected waste is exported abroad or sold to recycling plants in the country. Some of companies collecting recyclable waste are specialized in paper and/or plastic collection, others are metal scrap dealers where collection of other recyclable waste is supporting activity.

The collection of recyclable waste from large supermarkets and other commercial outlets is relatively well developed in the large cities.

Significant quantities of paper and plastic waste are collected by individual collectors from directly from the municipal waste containers or picked up at the landfills and then delivered to buy-back centres.

The collection is focused to materials where the revenues cover the collection and preparation costs: like metal scrap, paper and cardboard, foils, PET bottles, large items of rigid plastics.

There is no detailed and comprehensive information about the quantities of separately collected and recycled waste in RS. The very rough estimate is that the quantities of recycled packaging waste exceed 15,000 tonnes.

Generally, it is believed that separation of dry recyclables (paper/cardboard, plastics, cans/metals, glass) can generate positive income due to selling of recyclables, savings on landfilling and possible savings on transport costs to any regional landfill. Currently the results of the installed sorting lines in BiH are far below expectations and financially unsustainable. The reasons are (i) the low waste quantities/year; (ii) low awareness with the waste generators for proper separation at source; (iii) role of informal sector taking valuable dry recyclables out of containers or buying directly from the commercial/institutional /industrial sector (CII). Separation at source by households is less than 1% mainly due to lack of infrastructure and public awareness campaigns. It is noted that in the Strategy Study 2017-2026 a scenario is recommended without separation at source except for Banja Luka. However, the Strategy mentions also that separate collection and recycling of packaging waste should reach 50%, which would be equivalent to 23% of the total mixed waste flow in 2026. It is not known how to reach this without separation at source as separation of mixed waste can achieve maximum 10% based on international experience with Materials Recovery Facilities (MRF's.).

Current problems in the field of waste separation and recycling can be summarized as follows:

- Individual municipalities are too small to generate sufficient volumes to operate separation/sorting facilities.
- No clear policy. The WM Strategy recommends no separation at source except in Banja Luka region but the Strategy is also indicating targets for waste separation
- Lack of public awareness mainly due to lack of public outreach programs to promote waste separation. Municipalities are not allocating budgets and are not employing communication specialists.

4.4 Documentation and reporting requirements

4.4.1 Waste Statistics

Institute for Statistics of RS

The Institute for Statistics of RS is the competent authority of statistics in RS based on the Law on Statistics of RS (O.G. of RS, No. 85/03). The sector of labour, prices, living standard and environmental statistics together with the Department of labour and environmental protection statistics are competent for the area of environmental protection.

Institute for Statistics of RS processes data obtained through statistical surveys entitled "Annual Report on Collected Waste (form KOM-6aP) and the "Annual Report on Disposed Waste (form KOM-6aD). Reports KOM-6aP and KOM-6aD are submitted by public utility companies and other companies authorized to collect and dispose of municipal waste, as well as by operators which manage landfill sites.

In 2012, Institute for Statistics of RS published the report "Implementation of the European Statistics Code of Practice in Institute for Statistics of RS - Self-assessment and Future Activities". The document was drafted in the form of an action plan of the Institute, with the purpose to support the process of development and provide a framework for assessing and monitoring the quality of statistics of RS, based on the quality criteria of the European statistical system. The document presented self-assessed compliance of the RS statistics with the principles of the European Statistics Code of Practice and the

planned improvement actions necessary to achieve full compliance and implementation of quality management system.

At present there are no specialized statistical surveys on packaging consumption and the use of electrical and electronic appliances in RS.

4.4.2 Data about packaging and WEEE

There are no reliable data about the packaging waste and WEEE quantities in RS.

The average percentage of dry recyclables in generated waste is estimated to the amount of 32% or 104,000 tons in 2013. The packaging waste is estimated to amount approximately 73,000 tons out of this quantity.

The report "*Solid Waste Management Sector Review and Recommendations on Sector Reform and Investments* The waste generation and composition forecast assumes that per capita waste generation will grow from 277 to 303 kg/cap/year, which is around 9.4% increase in 12 years. It is assumed that dry recyclables fraction will grow 50% faster than the overall waste generation per capita. According to this the amount of recyclables will increase from 87 kg/cap/year in 2013 to 100 kg/cap/year in 2025. The total amount of recyclables in 2025 is estimated to 120,842 (34%).

Table 4-4: Realistic scenario waste flows (tons/year)

Realistic Scenario	2013	2025
Realistic Scenario	2013	2025
Total Waste	324,658	355,418
Collection coverage	64%	84%
Total waste collected	207.781	298.551
Recyclables	66.490	101.507
Direct collection (10%)	10.389	12.084
Source Separation	Negligible	26.827
Other	47.790	68.667

The quantity of packaging waste is estimated to approximately 75% of the total amount of recyclables and according to above forecast will grow to 90,800 tonnes in 2025.

4.5 Recycling and recovery targets

4.5.1 Recycling and recovery targets for packaging waste

Waste Management Strategy of RS for the period 2017-2026 has defined the following targets for recovery and recycling of packaging waste:

Table 4-5: Recycling and recovery targets for packaging waste

Waste	**Deadline**	**Target (% by weight)**	
		Reuse[31]	Recycling
Packaging waste	2017	35	8

[31] The target most likely refers to "recovery".

	2021	40-45	15-20
	2026	50-60	25-45

It shall be noted the significant difference between the recovery and recycling targets. Such differences are unusual and cannot be justified by technical grounds (e.g. the energy recovery from waste cannot compensate such big difference).

The Decree on the Management of Packaging and Packaging Waste (O.G. of RS, No. 36/15) defines the general objectives for the management of packaging and packaging waste. Producers are obliged to ensure proper management of packaging waste either by themselves, or by transferring their obligations to a System Operator. Where they elect to comply themselves, they report directly to the Environmental Fund of RS. The Decree includes the following targets for the preparation for reuse and recycling of packaging waste (as a percentage of packaging placed on the market in each year):

- 20% by 2015; and
- 35% by 2016, 2017 and 2018.

The recycling and recovery targets above are considerably below EU

4.5.2 Separate collection recycling and recovery targets for WEEE

Waste Management Strategy of RS 2017-2026 has defined quotas for reuse and recycling of WEEE, as follows:

Table 4-6: Recycling and recovery targets for WEEE

Waste	**Deadline**	**Quota (% of weight)**	
		Reuse	**Recycling**
WEEE (4 kg/capita/year)	2021	50	25
	2026	70-85	50-80

4.6 Recycling capacities

The recycling industry is not well established in the RS. There is only one plastic recycling factory in operation and the majority of recyclable waste collected is delivered to other plants in BiH or exported abroad.

Omorika Reciklaža is a factory which recycles PET packaging. The company was founded in 2007 and is located in Johovac near Doboj. Waste PET is used as the raw material and is recycled in a modern recycling plant with an installed capacity of 400 t/month. Waste packaging is used for production of high purity PET flakes which are then used for producing PET recycled granulates (rPET).

Figure 4-3: PET Recycling Factory Omorika Reciklaža
(Source: Omorika Reciklaža)

4.7 Analysis of EPR systems in place

The Ministry issued a permit for PRO to EuroBeta, Banja Luka (http://www.eurobeta.ba/) in January 2016. Considering the short period for the functioning of the system is difficult to evaluate the results achieved.

Despite of the short period the following preliminary observations can be made:

- The intentions of the PRO to develop the household packaging separate collection system are not clear and there is no dialog established with some of the largest waste management companies in RS. For example, the operator of waste collection services in Banja Luka was not aware for the existence of producer responsibility scheme for packaging waste and nobody contacted the company for organizing separate collection in the city.
- The service tariffs charged by the operator are considerably higher than the corresponding tariffs of the PROs in FBiH and even exceed the tariffs in several EU countries with well established packaging waste management systems. It seems that the tariffs do not address the real costs and cross-subsidies between the different packaging materials are allowed. The small differences between the PRO tariffs and the fees charged by the Fund demonstrate an attempt by the operator to maximize its revenues and puts under question the non-for-profit character of its activities. The possible argument for the high fees charged by the operator in RS can be the small size of the market and the relatively high share of administrative costs.
- Some of the big multinational companies operating on the marker in RS prefer to pay directly to the Fund instead of signing contract with the operator. Considering that, the same companies are shareholders of the PROs in FBiH such practice is a reason for concern.
- The website of the operator does not contain information about the founders of the company and it's not obvious whether the shareholders of the EPR scheme are representing significant amount of packaging placed on the market in RS.
- It's not clear why companies registered in Banja Luka who are founders of operators in FBiH are not active in RS and why the operators registered in FBiH didn't apply for a permit in RS.

The service tariffs charged by the PRO are very high and looks like they are defined as percentage to the fees charged by the Fund.

Table 4-7: Comparison of fees charged by the Fund and PRO in RS

Material	**Tariff Operator** (BAM/tonne)	**Packaging Fee Fund**[32] (BAM/tonne)

[32] Administrative fee of 2 BAM/tonne not included

Paper&cardboard	180	260
Plastic	210	306
Glass	130	188
Metal	100	135
Wood	80	117.50
Other	200	

Source: Fund for Environmental Protection and Energy Efficiency of the RS

The fees shall be paid to the operator in quarterly instalments based on reports on the quantity and type of packaging placed on the market in RS.

4.8 Shortcomings

Valuable materials are lost and recycling industry could be further developed providing income and jobs to more people. There is no waste separation system in any municipality. Waste source separation is a requirement stipulated by the law on waste that is incorporated in the Waste Management Strategy to facilitate recycling. It is a Municipal task to organize a system for waste sorting and establish an appropriate infrastructure to enable this process.

Currently, the planning and guidance for the implementation of effective and efficient waste management systems are hampered by the lack of reliable data on waste generators, quantities, composition, recovery, recycling, disposal, stakeholders and so on.

A comprehensive national Waste Information System (WIS) is needed in order to provide required data for national and international reporting, improve access to waste data, support regulatory reform and associated reporting, support a consistent and comprehensive data capture process, provide accurate and reliable data to inform decisions, strategies and business, support consistent methods, classification and terminology for waste data, and to support state and regional regulations.

Municipalities, EPR system operators, recyclable waste collection and processing companies should participate in the regular reporting system. An inventory of respondents should be established at entity level. The responsible organization could be the Environmental Protection and Energy Efficiency Fond of RS in close cooperation with the Ministry of Spatial Planning, Civil Engineering and Ecology of RS. A WIS should have its own website where all official waste reports and statistics will be available to the public.

Despite the significant progress in harmonizing of legislation with EU acquis in the sector, a lot still have to be done. Amendment of Waste Management Law and adoption of special regulation on the management of WEEE will be required in order to implement EPR system.

The RS Waste Management Strategy was adopted and put into force in July 2017. The following step is to develop a Waste Management Plan (WMP) for RS comprising the investment plans.

There is a need for strengthening the municipalities for the implementation of the municipal WM plans that they are obliged to develop according to the Law on Waste.

The municipalities' in-house expertise in solid waste management is very limited. In most municipalities no dedicated SWM staff exists and this seriously hampers the implementation of MSWM tasks.

Implementation of solid waste management policy in RS requires capacity with a strong competent staffing. Presently the MSPCEE does not have a distinct Solid Waste Management section but is incorporated in the Department for Environmental Protection. It is recommended to create a distinct

Solid Waste Management section responsible for preparation of guidelines, planning, coordination, supervision and monitoring of waste management on republic level.

Improvements in inspection and enforcement will be needed to enhance sector performance. A review of their organization and operations, including staffing, tasks, bottlenecks (especially (un)availability of financial resources), shortcomings, etc. is recommended.

The role of the Association of Municipalities as official discussion partner for all municipal (environmental) matters need to be formalized.

At operational level the collection and disposal companies need strengthening and training of staff to become more efficient by improving accounting procedures, tariff calculations, cost control, planning, maintenance, equipment procurement, data collection and reporting, etc.

The implementation of efficient and cost effective system for the management of packaging waste and WEEE requires substantial changes in the existing legal requirements, organizational set up and operational practices at all levels. RS is facing similar problems like other part of the country. The major issues that need to be addressed are following:

- The waste management policy documents and the respective legislation adopted at entity level do not provide clear objectives what to be achieved by the EPR schemes with regard to separate collection and recycling.
- There are no reliable data about the quantity of packaging placed on the market and the amount of recyclable waste separately collected, recycled or exported.
- The recycling and recovery targets defined by the legislation for packaging waste are low and their achievement will not present any challenge for the PRO. In this situation, there is no formal obligation or incentive for the PROs to develop more expensive systems for separate collection of household packaging waste.
- The permits issued to the EPR organizations do not contain conditions or clear requirements about the separate collection system to be implemented. Usually these include: type of the separate collection system, minimum population coverage, minimum quantities collected, materials collected, minimum container volume installed, collection frequency, required sorting infrastructure.
- One of the major problems in the existing system is the lack of real involvement on behalf of the municipalities. The local authorities are not actively participating in the planning and implementation of the system. The waste management and in particular separate collection and recycling shall become a real priority for the municipal administrations.
- There are no clear rules about the role of local authorities in the establishment of separate collection systems for recyclable waste on their territories and how these systems shall be financed. These issues are left open and agreed bilaterally between local authorities and EPR organization on case by case basis.
- The annual reports of EPR organizations are not subject to independent audit prior submission to the authorities. The annual reports are mainly focused on the achievement of recycling targets and do not provide information about the developments in the separate collection systems, sorting and recycling infrastructure, communication and awareness campaigns, etc.
- The capacity of authorities at entity and local levels is absolutely not sufficient to implement a proper planning and enforcement of legal requirements. The shortage of staff will not allow significant change in the situation.
- Private sector is not sufficiently involved in the provision of separate collection and sorting services.
- Lack of public awareness mainly due to lack of public outreach programs to promote waste separation. Municipalities are not allocating budgets and are not employing communication specialists.

- The recycling industry in BiH is not well developed mainly due to the limited size of the market. In this situation the recycling shall rely on the export of waste which brings additional cost and efforts.
- The management of packaging waste and WEEE shall be considered within the broader frame of municipal waste management. The improvement of separate collection and recycling of packaging waste and WEEE will not be possible without improvements in the overall municipal waste management system.
- The industry shall recognize its obligations and put more efforts in setting up efficient EPR schemes. The representativeness of the PRO for packaging waste shall be improved to the maximum possible extend and the non-for-profit principle of operation have to be guaranteed. Considering that RS is a very small market, the appearance of several competitive PROs shall be avoided if possible. In this respect the involvement of main companies putting large quantities of packaging on the market in RS and the industrial associations as shareholders in the EPR operator is strongly recommended.

5 WASTE MANAGEMENT SITUATION IN THE DISTRICT OF BRCKO

According to the report "Census of population, households and dwellings in Bosnia and Herzegovina, 2013: Final Results", the population of Brcko District (hereinafter called "BD") is 83,516 citizens. In urban settlements live 45,516 citizens (54.50%) in a suburban (semi-urban) and rural areas live 38,000 citizens (45.50%).

It is calculated that in BD around 25,073 tons of municipal waste is generated in 2013.

According to the composition of the waste, the single dominant fraction in municipal solid waste in BD is organic waste from kitchens and gardens (approximately 39%), while the dry recyclables (plastic, glass, paper/cardboard, aluminum cans, PET, foil, metals) accounts for approximately 47% of municipal solid waste.

During the period 2013 and 2025, the expected average annual waste growth rate is 1.11%. The average waste generation will increase from 0.82 kg/cap/day to 0.94 kg/cap/day.

It is expected that in the future, the MSW collection coverage will increase from 81% up to 88% in 2025.

Table 5-1: Municipal waste projections for BD

	2013	2025
MSW (t/y)	25,073	28,590
Enterprises' waste (t/y)	752	1,001
Total (t/y)	25,825	29,591
Waste kg/cap/year	300	342
Dry Recyclables kg/cap/year	141	172
% of recyclables	47%	50%

Considering the current baseline (81% collection coverage, almost no separation and recycling, poor basic service level including existing non sanitary landfill) transformation of the waste management system in BD will require a coordinated effort at all administrative levels, significant development of human resources, increased public participation and quite important financial resources.

The realistic scenario for the future waste management system envisages the extension of collection services to 100% of population living in urban areas and 60% of population living in rural areas. The source separation shall be implemented and collection of 30% of recyclable waste need to be achieved.

The following table present the evolution of this scenario between 2013 and 2025.

Table 5-2: Municipal waste objectives for BD

	2013	2025
Total Waste	25,073	28,590
Collection coverage	81%	88%
Total waste collected	20,309	25,159
Recyclables	9,545	12,580
Direct collection (10%)	955	1,258
Source Separation	2,577	3,396

Brcko District has adopted a series of laws governing environmental protection and related secondary legislation (regulations, decrees and decisions):

- The Law on waste management (Official gazette of Brcko district, no. 25/04, 1/05, 19/07, 2/08 and 9/09)
- The Law on environmental protection (Official gazette of Brcko district, no. 25/04, 1/05, 19/07, 9/09)
- The Law on air protection (Official gazette of Brcko district, no. 25/04, 1/05, 19/07 and 9/09).
- The Law on water protection (Official gazette of Brcko district, no. 24/04, 1/05, 19/07)
- The Law on nature protection (Official gazette of Brcko district, no. 24/04, 1/05, 19/07 and 9/09).

In Brcko District, The Law on Waste Management (Official Gazette of Brcko District, no. 25/04, 1/05, 19/07, 2/08 and 9/09) establishes a general framework for all aspects of solid waste management in Brcko District, primarily:

- Planning the waste management (waste management strategy, regional and local plans for waste management),
- License for waste management,
- Waste management supervision,
- Activity and responsibility related to the waste management (liabilities of the generator and reseller, waste collection system, treatment, collection, usage, transport, waste deposit, landfills, incineration)

The purpose of the Law on waste management is boosting and ensuring the most important work conditions:

- Preventing the waste generation,
- Processing waste for reuse and recycle,
- Separation of raw material from the waste and its usage in energy production, and
- Safe waste disposal

Based on this Law following statutory acts have been passed:

- The Rulebook on waste management that is not on the list of hazardous waste or whose content is unknown (Official gazette of Brcko District, no. 32/06)
- The Rulebook on content of the waste management adjustment plan for the existing treatment plant or waste deposit and activities undertaken by the authorized department (Official gazette of Brcko district, no. 32/06)
- The Rulebook on conditions of the waste management responsibility transfer from the generator and reseller to the waste collection operator (Official gazette of Brcko District, no. 32/06)
- The Rulebook on issuing licenses regarding the minor businesses activities within the waste management (Official gazette of Brcko district, no. 32/06)
- The Rulebook on waste categories with lists (Official gazette of Brcko District, no. 32/06)
- The Rulebook on financial guarantees that can ensure cross border waste transport (Official gazette of Brcko district, no. 32/06)

The Waste Management Strategy is a part of the EP Strategy for Brcko district, BiH, for the period 2016-2026 was adopted in 2017. The Strategy was prepared by the Department for Spatial Planning and Property-Legal Affairs of the Brcko District Government. The Strategy evaluates the waste management current condition, sets long-term aims for waste management and ensures conditions for rational and sustainable waste management. The strategy gives common objectives, but no specific targets with timeframe.

Table 5-3: BD strategy objectives[33]

Objectives	Measures	Deadline
Establishment of integrated waste management system (waste generation, collection, separation, transport, recycling, secondary raw materials, disposal) with special emphasis on municipal waste	Promotion of cleaner production practice and reduction of waste generation	2019
	Establishment of system of separate collection and recycling of waste	2019
	Locating and phased construction of Waste Management Centre with all necessary facilities for integrated waste management	2019
	Development of financial model for integrated waste management	2023
	Prevention of wild dumps	2019

The Strategy contains mainly an analysis and assessment of the current waste management system with its shortcomings (legal, operational, financial, public awareness). No information is given on targets to be achieved for waste collection coverage, separation and recycling. However several of the strategy objectives are intended to improve the situation:

[33] Environmental protection strategy of Brcko District in BH 2016-2026, available at http://www.bdcentral.net/index.php/ba/trezor-akti/doc_details/7656-environmental-protection-strategy-of-brcko-district-in-bh-for-the-period-2016-2026

- Adjustment of legal and sub-legal regulations with the EU regulations and international conventions (passing a new Law on waste management and adequate sub-legal acts in accordance with the EU Directives and international conventions).
- Institutional strengthening of management structure in the Brcko District in order to improve and approximate the waste management to the best EU practice (creating an efficient company for waste management and establishing a data base on waste and more efficient reporting).
- Setting an integral system for waste management (promoting the practice for cleaner production and decrease of waste generation, establishing a system for separate collection of waste and waste recycling, locating and phase based construction of waste management center with all necessary facilities for integral waste management, development of financial mode for integral waste management, as well as prevention of illegal dumpsites through enforcing inspection and cooperation with the population).

In accordance with the adopted Strategy for waste management it is necessary to make plans for waste management.

Brcko District is a self-managing administrative unit of Bosnia and Herzegovina, and is an official part of both entities. The legal power is in hands of the Brcko District Assembly, executive power is in hands of the Brcko district Government and court power is in hands of Brcko district courthouse.

By the Brcko District Statute the issues regarding environment (waste management), housing, urban and spatial planning, public services are under the Brcko District authority.

Department for Spatial Planning and Property-Legal Affairs and Public Utilities Department are directly involved in waste management issues.

The Public Utilities Department performs the following activities:

- Analysis of development trends in the communal domain
- Preparation of strategy concepts for communal service development
- Implementation of projects from the communal service development strategy
- Conducting supervision and reporting to the Government on communal strategy implementation
- Improving any modernization of communal infrastructure
- Preparation of draft laws and by laws
- Managing demands and offers related to the communal services and prices
- Performing other activities in accordance with the Statute and laws of Brcko district that are under this Department's authority.

Public company „Komunalno Brcko" is entrusted with performing services of general interest in Brcko District, apropos distribution of electric energy, production and distribution of water, maintenance and arrangement of public areas, collection, transport and deposit of communal waste. The work unit Cistoca is in charge of collection, transport and deposit of waste.

The working unit Cistoca carries out the actual services for collection, transport and disposal of waste. Besides waste collection, the company is also carrying out street cleaning, snow removal and maintenance of green areas. "Komunalno Brcko" is directly reporting to the Assembly (elected parliament).

The waste collection system for households is a mix of (i) communal containers of 1,100 litres and (ii) the use of skip containers with a capacity of 5-7m³. The same type containers are used for the commercial and industrial Clients. No waste separation at source exists. The total annual waste generated is estimated at 25,000 tons. The waste collected from households is about 20,000 t/y or 67 t/day and about 800 t/y from industries.

About 95% of the collected wastes in BD are disposed at a non-sanitary landfill without a weighing scale. Discussions are going on to transport waste to the sanitary regional landfill in Bijeljina as a temporary solution until a new site is found and a new sanitary landfill is constructed.

Brcko District has a fixed tariff per household being BAM 5.64/hh/m excl. VAT and BAM 6.6/hh/m incl. VAT or BAM 79/hh/year or BAM 88/ton based on a waste generation of 0.9t/hh/year assuming a family size of 3.09 persons and a waste generation rate of 0.8 kg/cap/day. The current average spendable income of the households is approximately BAM 1,672/month. It can be concluded that the tariff paid by households for waste management is 0.4% of the spendable income. The average tariff collection rate improved over the period 2013-2016 from 65% up to 99%.

The tariff has not been increased since many years. "Komunalno Brcko" complains that tariffs are too low to cover the actual costs.

Tariffs for municipal waste from the commercial and institutional sector are calculated per m² and per activity. The tariffs vary from BAM 13.2/m²/m for newsstands down to BAM 0.35/m²/m for budget institutions. The commercial/institutional sector can also be charged per container and the tariff for a 5-7m³ container varies between BAM 71.48-104.13 incl. VAT depending on the distance.

BD does not have a special regulation on the management of packaging waste and WEEE. Considering the very small market, the implementation of EPR schemes, similar to these operating in FBiH and RS, for these waste streams will be difficult and costly solution.

6 GENERAL OVERVIEW OF EPR PRACTICES IN EU COUNTRIES

6.1.1 Comparison with EPR systems in EU member states

Extended Producer Responsibility (EPR) is an efficient resource management tool whereby producers take over the responsibility for the end of life management of their used products. This can include collection, sorting and treating these for their recycling and recovery.

Its basic feature is that actors across the packaging value chain (manufacturers, importers and retailers) assume a significant degree of responsibility for the environmental impact of their products throughout their life-cycle. This includes products' 'upstream' impact linked to the selection of materials, product design and production processes as such, as well as 'downstream' impact relating to the products' use and disposal.

In so doing, producers accept their responsibility when designing their products so as to minimise their life-cycle environmental impact. They thereby assume legal and economic liability for their products' environmental impact, starting from the design phase.

Through EPR, Member States also share public service responsibilities with private companies, which have to assume these themselves.

The policy first appeared in the early 1990s in a few European Member States, especially for packaging waste, and has later on expanded across the EU and beyond. Since then, EPR has contributed to significant increases in recycling rates and public spending savings on waste management, and helped decouple waste management from economic growth.

The legislative framework for the development of EPR at the European Union level is composed of both general waste legislation, and specific directives framing the recovery and recycling of specific waste streams. The Waste Framework Directive (2008/98/EC) sets the general framework for waste management in the EU. It enables Member States to set up EPR schemes.

The EU has moreover issued waste stream-specific directives, inter alia for packaging, waste electrical and electronic equipment (WEEE), end-of-life vehicles (ELV), batteries and accumulators (B&A). While WEEE, ELV and B&A require Member States to set up EPR for the products they cover, there is currently no obligation to set up EPR schemes for packaging. However, at least for household waste, most Member States (25 out of 28) have chosen to do so.

Today, almost all EU countries and developed economies have EPR programmes and policies in place. Such programmes are also in the scoping stage in some developing countries in Asia, Africa and South America. Nonetheless, the specific features and outcomes of these measures vary significantly across regions, countries and industries.

According to OECD there are four broad categories of EPR instruments at the disposal of policy makers. These typically address specific aspects of waste management, and can be implemented concurrently:

- Product take-back requirements. Take-back policies require the producer or retailer to collect the product at the post-consumer stage. This objective can be achieved through recycling and collection targets of the product or materials and through incentives for consumers to bring the used product back to the selling point.
- Economic and market-based instruments. These include measures such as deposit-refund schemes, Advanced Disposal Fees (ADF), material taxes, and upstream combination tax/subsidy (UCTS) that incentivize the producer to comply with EPR.
- Regulations and performance standards such as minimum recycled content. Standards can be mandatory or applied by industries themselves through voluntary programmes.
- Accompanying information-based instruments. These policies aim to indirectly support EPR programmes by raising public awareness. Measures can include imposing information requirements on producers such as reporting requirements, labelling of products and components, communicating to consumers about producer responsibility and waste separation, and informing recyclers about the materials used in products.

Instruments across these four categories can be implemented by governments as mandatory policies or alternatively be applied on a voluntary basis by producers themselves. The chosen mix of instruments will be different from one country, region and industry to the other, based upon political priorities, as well as on the social, economic, legal and cultural context.

The EPR has the following goals:

- To provide incentives for eco-design: Through EPR, producers establish an efficient end-of-life management for their products. This spurs them to design products that are easier to dismantle, reuse and recycle. Consequently, products' total environmental impact decreases and waste prevention is stimulated.
- To create a sustainable production and consumption policy: EPR encourages separate waste collection and recycling, as it is often implemented to help Member States to reach their recycling targets. By doing so, EPR also ensures citizens' cooperation, as they need to separately collect and sort their waste in order to facilitate recycling processes. This entails promoting education and awareness raising campaigns towards consumers, aimed at encouraging separate collection and recycling while discouraging littering.
- To reduce landfilling and develop recycling and recovery channels: EPR has proven to be an effective waste management tool for various different waste streams and can help divert waste from landfills. EPR moreover boosts the use of waste management options that are higher up in the waste hierarchy than landfilling, notably recycling.

The benefits from implementing EPR scheme can be summarized as follows:

- Increased collection and recycling rates (environmental effectiveness). Countries and regions that have implemented EPR policies have generally achieved higher collection and recycling rates. EPR encourages producers to improve the recyclability of products and materials, and to convert collected used products into a resource, thereby generating higher quality waste streams. In order to minimize costs, producers are incentivized to diminish the amount of virgin resources used in production.
- Reduction of public spending on waste management. The rationale behind EPR is to shift responsibility from local public authorities onto producers (and ultimately to consumers), thereby reducing public spending, i.e. taxpayers' money, on waste management operations.
- Reduction in overall waste management costs. Beyond a reduction in public spending, EPR is expected to lead to reductions in the overall costs spent on waste management. Producers are indeed incentivized to optimize the cost efficiency of collection and recycling operations. The overall costs and benefits of EPR programmes vary from one scheme to the other and could be highlighted through a specific cost effectiveness analysis.
- Design for environment (DfE) innovations. Under EPR, producers are financially responsible for the treatment of their products' end-of-life and are thereby incentivized to minimize waste disposal costs. These costs can be reduced through investments in DfE innovations and by increasing the durability and reusability of products. EPR instruments can further support DfE for example through policies that impose requirements per weight unit of waste as opposed to per unit consumed, which encourages manufacturers to make their products lighter. In addition, DfE incentives allow policy makers to address environmental damages that may occur several years after the point of production or consumption. This differs from traditional policies such as taxes and tradable permits that only address immediate damages (i.e. damages measured at the point of production).

In addition to the benefits identified above, EPR programmes are also believed to generate a range of broader benefits, including increased technological and organisational innovation, a diversification of sources of material supply and therefore a contribution to resource security, and a better organisation of supply chains through the emergence of more international operators in the recycling sector.

EPR is an individual obligation as companies that place products on the market are responsible for their proper end-of-life management. In practice, however, producers often work collectively to exert this responsibility by setting up Producer Responsibility Organisations (PROs), which are also called EPR or compliance schemes.

PROs should be non-profit collective entities, set up and fully owned by the industry that is bound by legislation. Therefore, PROs become responsible for meeting recovery and recycling obligations on the industry's behalf.

Some PROs have a public service mission and operate in a non-for-profit or profit-not-for-distribution basis, but others, owned by investors and/or the waste management industry, actually seek profit. Non-profit systems deploy a holistic approach to waste management, embracing both waste prevention and recycling. Coupled with their operational implementation, they maximise environmental, economic and social benefits.

Generally, PROs exert the following functions:

- Organise, often together with the local authorities, the take back of post-consumer products.
- Ensure recovery and recycling targets compliance.
- Assist companies in (packaging) waste prevention, eco-design promotion & communication materials towards the waste holder, together with the local authorities.
- Verify the data and reporting of those companies.
- Report to national/entity authorities.

The companies bound by EPR legislation must properly handle the end-of-life management of products and their packaging either individually or by setting up collective entities, mainly PROs. These are in charge of ensuring the recovery of the used products, usually by co-financing, either organising or coordinating the collection, as well as sorting and recycling aspects, where applicable, of packaging waste. For industrial and commercial packaging waste, tasks include steering and monitoring.

An industry-owned PROs can be mandated by the obliged industry to take responsibility for collection or take-back, and sorting or recycling, thus shifting the individual responsibility to a collective one. The mandate should be issued by competent authorities in the form of an accreditation or a license. The latter has to ensure that the most sustainable system is established, at the lowest cost for both society and producers.

EPR systems also need to guarantee that consumer interests are served, and that education and communication goals are pursued. This is especially important in the case of household packaging.

At the municipal level, PROs must establish and maintain the necessary infrastructure for the collection, or take-back, and the sorting of packaging waste. Citizens should be equipped with an easy access to infrastructure, enabling them to sort waste on a daily basis, so that household waste collection can be deployed. At an industrial and commercial level, as packaging waste is often directly collected by waste collectors, PROs must, at least, establish a monitoring system for both packaging quantities that have been put on the market and collected as well as recycled.

PROs should guarantee that, once packaging waste is collected, it will be treated appropriately. As such, PROs need to have a solid financial basis. Governments have to establish a strict authorisation process so that only reliable organisations with secure finances can receive a license.

Transparency is an important feature of PROs. In a bid to seek transparency, EPR schemes provide annual reports explaining how the objectives set out by their respective governments have been fulfilled. These reports should be audited by an independent and competent third party. When conditions are not fulfilled, sanctions ranging from fines to license withdrawal should be applied.

Furthermore, transparent procedures will avoid discriminating between domestic companies and importers, while also guaranteeing that large companies and small and medium enterprises (SMEs) are considered on an equal footing. The impact packaging has on the environment does not depend on its size or the producer's origin.

Particularly in relation to packaging waste arising at the municipal level, EPR schemes gather the necessary financial contributions from their members so as to co-finance the collection, sorting and recovery of packaging waste, if this falls within their system's scope. Funding represents a substantial part of the cost calculation for a packaged product. In line with EPR objectives, the collected fees have to take into account the end-of-life costs of a particular packaging. This is also how EPR contributes to shifting the responsibility for the used packaging from taxpayers to both producers and consumers of packaged goods.

Each stakeholder can only be financially responsible for the operations falling under their remit and influence. In this respect, 'reasonable financing' should be provided by the obliged industry so long as it covers the take-back, or separate waste collection and treatment, of their own packaging, within their dedicated collection systems at the municipal level.

Packaging waste that is either littered or ends up within municipal solid waste should not be part of producers' financial responsibility.

EPR can be implemented in many different ways. Thus far, in Europe, 30 countries have implemented EPR in their legislation and the industry has set up PROs. In some of these countries, the EPR schemes achieved great success, particularly due to clear legislation coupled with genuine cooperation between

all of the actors involved in the waste management chain. Actors include governments, local authorities, producers and waste management organisations.

EPR schemes rely on either national regulations or specific legislation for the waste streams they are part of. For example, EPR schemes for household and municipal waste are generally based on the producers' financial responsibility because they have been mostly introduced when the schemes were already in place and managed by local public authorities. By contrast, the EPR implementation for non-municipal waste varies significantly, and can for example be based on business-to-business arrangements. Solely in Belgium, the obliged industry has set up a specific PRO for industrial and commercial waste, VALIPAC. Its major role consists of monitoring packaging collection and recycling, in relation to the volumes brought on the market, collecting the respective data and motivating companies to separately collect their packaging waste.

Not all PROs have the same functions. As EPR requirements differ between countries, the role of PROs vary as well.

Most of the systems are limited to organisational and financial management tasks. The collection and recovery services are subcontracted by the system and carried out by specialized companies. These contracts are normally awarded on the basis of a tender procedure.

Some systems have established different entities in charge of certain activities and materials (e.g., within the ARA system[34], ARGEV is responsible for metal packaging, ARO for packaging made of paper, etc.) whereas other systems are active on a cross-sectoral basis (e.g., DSD[35]).

Key differing features include the following:

- Type of responsibility, either financial or organisational.
- Presence of competition among PROs and among waste treatment operators.
- Transparency and surveillance features such as free-riders' surveillance, waste management activities and PROs.

The EPR scheme can be compared based on the following main criteria:

- Individual or collective scheme (PRO). Individual collection and treatment schemes are mostly applied in business-to-business contexts characterized by a limited number of actors. Usually, though, producers organize and finance collective Producer Responsibility Organizations (PROs) that will carry out the collection and/or recycling of end-of-life products on behalf of their members. Between 1998 and 2007, it is estimated that more than 260 PROs were established in Europe. The number of PROs per sector varies a lot across countries: in France for example, 1 PRO is in charge of household packaging waste, compared to 29 PROs in the UK for the same sector.
- Organisational versus financial responsibility. The responsibility for waste management imposed on producers may either be financial or organizational, or both. In the first case, individual producers or PROs pay fees to municipalities, which remain in charge of waste management operations (usually the collection), while recycling is outsourced to specialist contractors. In the case of organisational responsibility, producers and PROs will finance and organise waste management operations and contract directly with recyclers.
- Allocation of responsibility among stakeholders. The main objective of EPR is to shift responsibility for managing a product's end-of-life from municipalities to producers. In most

[34] ARA Altstoff Recycling Austria AG
[35] Der Grüne Punkt - Duales System Deutschland GMBH (DSD)

schemes, however, municipalities remain in charge for some aspects of the organisation of waste management. Other actors, such as consumers and waste management operators, are usually also involved. In Germany, the role of municipalities differs for EPR schemes on WEEE (shared responsibility as producers handle the WEEE collected by municipalities) and on packaging, batteries and ELVs (full producer responsibility).

- Cost coverage. The cost coverage of waste management operations refers to two issues: first, how to define and calculate the full costs of managing a product's end of life under EPR; and second, whether producers bear the full costs, and if not what should be the allocation of costs assumed by different stakeholders. Typically, the concept of full costs includes the costs of waste management (collection, treatment, recycling) as well as a range of other costs depending on the scheme, such as the costs for public information and awareness campaigns, waste prevention actions, and the monitoring and surveillance of schemes. In line with the polluter pays principle, it is generally agreed that producers should at least bear the net costs of waste management for their products, i.e. costs for collection and recycling minus revenues from recovered materials. In certain schemes, producers do also bear other aspects of the full costs. In other schemes however, producers bear only a share of the full costs, the remainder being covered by municipalities. In France for example, the aim is for producers to bear 80 % of the costs of household packaging waste, with 20% falling to municipalities. Accordingly, the allocation of full costs within a scheme will depend upon the allocation of financial and organizational responsibility among stakeholders, and on where the tasks can be most efficiently handled.

A comparison of basic models to implement packaging waste management system is presented in the following table.

Table 6-1: Packaging waste management organizational alternatives

Policy	Description	Responsible for collection	Responsible for reporting/ organization	Financial contribution	Decision on contribution size	Costs for obliged industry
Ministerial system	Ministry takes care for all reporting	Municipalities	Ministry	-	-	none
Packaging tax	Obliged industry pays a packaging tax	Municipalities	Ministry	Obliged industry	Ministry	high
Public fund	Obliged industry pays a packaging tax for Ministry and to finance EPR	Municipalities or obliged industry	Obliged industry	Obliged industry	Ministry	high
Extended producer responsibility (EPR)	Obliged industry takes full responsibility for declaration of packaging and recycling	Municipalities or obliged industry	Obliged industry	Obliged industry	Obliged industry	Low to moderate

According to the organization EXPRA (Extended Producer Responsibility Alliance) the following EPR models can be considered:

- **PROs in hands of obliged industry** (Belgium, Czech Republic, Ireland, Italy, France, Netherlands, Norway, Portugal, Spain): Obliged industry creates one common non -profit entity that collects the necessary funding, cooperates with local authorities and ensures recycling in the most cost-efficient and environmental way.
- **Dual model** (Austria, Germany, Sweden): Industry has full operational and financial responsibility over collection, sorting and recycling. There is a separate collection system designated to local authorities but their influence is minimal.
- **Shared model** (France, Spain, Belgium, Netherlands, Italy, Czech Republic, Slovenia,): The responsibility is shared between industry and the local authorities based on common agreements regarding collection. Municipalities are responsible for collection, and often for sorting of packaging waste, arising on the municipal level, while industry's financial responsibility differs from country to country.
- **Tradable Certificates Model** (UK, partly Poland): There is neither a link between industry and municipalities nor differentiation between commercial and packaging arising at the municipal level.
- **Vertical integrated systems** (Germany, Poland, Slovenia, Romania, Bulgaria): Several, usually profit-oriented entities compete to attract obliged companies
- **Sharing the collection infrastructure** (Germany): Inhabitants have access to a common container and the collected packaging waste is split between the various PROs prior to being sorted. In this case, the cost distribution is established by a clearing house.
- **Competing on the infrastructure** (Estonia): Every PRO offers its own container to inhabitants.
- **PROs only responsible for packaging arising at the municipal level** (Belgium, Germany, France, Spain), for commercial packaging (Belgium), or for integrated packaging waste streams (Netherlands, Italy, Czech Republic).
- **Each PRO in a separate district** (Poland, Romania, Bulgaria, Slovakia, Malta, Latvia, Lithuania): Each PRO signs up with as many municipalities as needed to fulfil targets according to market shares.

Some of the above features of EPR system can be implemented in parallel.

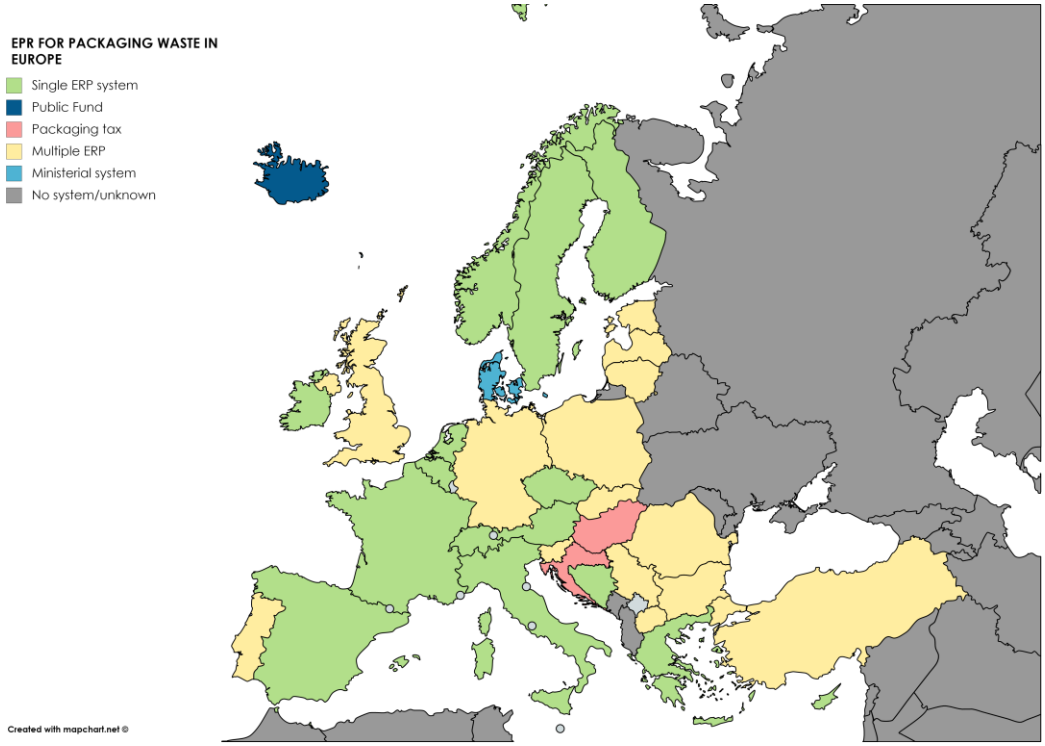

Figure 6-1: EPR for packaging waste in Europe
(Source:)

Another comparison of the packaging waste management systems functioning in Germany, Spain and Great Britain is presented in the following table.

Table 6-2: Comparison of EPR schemes for packaging waste in Germany, Spain and Great Britain

	Germany	Spain	Great Britain
Model	Full responsibility	Shared responsibility	PRN
Ownership	Privately owned	Owned by the producers	Privately owned
Market environment	Competition	Monopoly	Competition
Number of schemes	10	1	26
Profit oriented vs non for profit	Profit	Non-profit	Profit
Prices	Client specific prices	Prices as announced	Prices vary
Contracting WM	Compliance schemes	Municipalities	Municipalities
Material ownership	Compliance schemes	Municipalities	Municipalities
Household vs non-household packaging	All packaging	HH packaging only	All packaging

6.2 Comparison of licensing fees PROs in different European Countries

There are several factors affecting fee levels which should be taken into account when comparing the relative costs of compliance across various European countries. Major factors influencing relative compliance costs include the following:

- Existing collection and recovery infrastructure in the waste management sector.
- The source of packaging used to meet national recycling quotas (household only or all packaging).
- Household packaging waste is more expensive to collect and recover than packaging waste arising at industry's back door.
- The proportionate share of costs which industry bears. Some schemes meet 100% cost of collection and recovery, while others only pay a share thereof.
- National recycling quotas and the effect of derogations.
- Collection system used affect charges. Bring systems are generally less expensive than kerbside collection.
- Geographic location and population density. Remote and sparsely populated regions will generally be more difficult and expensive to collect from.
- Enforcement regimes influence costs. The more companies who participate in the scheme, the greater the spread of the cost base.
- Labour costs and general overheads differ depending on the prevailing local economic conditions.

The types of costs covered and the prices for recycling charged by the various systems in the Member States also differ to a considerable extent.

All of the systems have licensing fees per quantity of material (e.g. EcoPack Bulgaria, CONAI in Italy, Latvijaz Zalais Punkts). Different system use different fee per material structure.

Some systems have different fees for household (sales) packaging and commercial/industrial (group, transport) packaging (e.g. Cyprus Green Dot, EKO-KOM – Czech Republic, ERO – Estonia, Green Pack in Malta)

Some systems have different fees depending on the packaging size and volume (e.g. ARA in Austria, Gront Punk Norway.

Some system have additional fees per unit of packaging (e.g. HERRCO in Greece) or minimum fee per packaging unit (e.g. Fost Plus in Belgium)

Some of the systems charge participation fee as a flat fee per tonne (e.g. Repak in Ireland)

Some of the companies have set a minimum licensing fee per company (e.g. EcoPack Bulgaria) or standard fee for companies with low packaging amounts and/or joining fee (e.g. REPA in Sweden).

In limited number of cases discounts from the standard fees are provided for certain categories of clients. For example, Ecopack Bulgaria gives a 10% discount for in-time submission of monthly reports and additional 10% for in time payment.

Some of the PROs offer additional services for their clients. The additional services include providing of additional separate collection containers and organizing the waste collection, buying of sorted recyclable waste, consultations in different waste management subjects, support in organizing collection of municipal waste and/or hazardous waste, etc. Such additional services can be paid or presented as a hidden form of discount.

The table below presents a comparison of the fees charged by the different PROs for packaging waste in several EU countries.

Table 6-3: Licensing fees charged by EPR schemes in selected European countries

Country	Belgium	Austria	FBiH	RS	Bulgaria	Cyprus	Lithuania	Latvia	FYR Macedonia
Organisation	Fost Plus	ARA ALTSTOFF RECYCLING AUSTRIA AG	Ekopak	EURO BETA[36]	EkoPack Bulgaria	Green Dot - Cyprus	VšĮ "Žaliasis taškas"	LATVIJAS ZAĻAIS PUNKTS, JSC	PAKOMAK d.o.o Skopje
Materials	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg
Glass	0,021	0,084	0,013	0,065	0,022	0,029	0,059	0,062	0,020
Paper, cardboard	0,017	0,095	0,013	0,091	0,041	0,047	0,025	0,033	0,019
Steel/metal	0,124	0,280	0,009	0,050	0,015	0,095	0,044	0,068	0,021
Aluminium	0,033	0,310			0,053	0,021			
Plastics	0,282	0,610	0,018	0,106	0,058		0,081	0,149	0,023
PET bottles and flasks (and PET caps) *	0,211					0,106			
HDPE bottles and flasks (and HDPE caps)	0,211					0,106			
Composite					0,071				
Beverage cartons	0,246	0,095				0,123	0,122		
Other composite materials		0,610	0,015				0,125		0,023
Other recoverable composite materials	0,282								
Other non-recoverable composite materials	0,311					0,157			
Wood	0,282	0,018		0,040	0,095		0,017	0,016	0,022
Textile	0,282	0,150	0,008		0,023				
Other				0,101					
Biodegradable		0,450							
Other materials (china, stoneware, etc.)	0,311	0,120					0,033		
Packaging containing and /or contaminated by hazardous materials			0,281						
COMMERCIAL	Separate PRO		No separate fees	No separate fees	No separate fees		No separate fees	No separate fees	No separate fees

[36] 5% discount applies for on-time reporting and payment

Country	Belgium	Austria	FBiH	RS	Bulgaria	Cyprus	Lithuania	Latvia	FYR Macedonia
Organisation	Fost Plus	ARA ALTSTOFF RECYCLING AUSTRIA AG	Ekopak	EURO BETA[36]	EkoPack Bulgaria	Green Dot - Cyprus	VšĮ "Žaliasis taškas"	LATVIJAS ZAĻAIS PUNKTS, JSC	PAKOMAK d.o.o Skopje
Materials	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg	EUR/kg
	licensed for CP								
Paper, commercial		0,035				0,043			
Glass, commercial		-							
Ferrous metal, commercial		0,060							
Aluminium, commercial		0,080							
Plastics commercial						0,038			
Foils, commercial		0,070							
Moulded containers, commercial		0,070							
EPS, commercial		0,190							
Beverage cartons, commercial		-							
Other composite materials, commercial		0,100							
Ceramics, commercial		0,100							
Wood, commercial		0,008				0,012			
Textile, commercial		0,100							
Biodegradable materials, commercial		0,100							
Other						0,050			

As it becomes apparent, a straightforward comparison is not possible, as the materials are grouped in a different way in each separate country. Besides, in some of the countries additional membership and other fees apply, as well as various types of discounts.

Nevertheless, it can be concluded that the licensing fees for packaging placed on the market in FBiH are lower than in the neighbour countries, and considerably below the levels set in countries like Austria, Belgium and Germany where the recycling of packaging waste is well established.

The fees charged by the operator in RS are several times higher than fees charged by EKOPAK in FBiH. They also exceed fee levels in most of the Central and Eastern European Countries, applying higher recycling and recovery targets.

6.3 Main challenges in implementing EPR scheme

Given that different countries face comparable challenges at some point during the development of EPR, the list provided below does not distinguish between countries but reviews key challenges according to four categories: governance and administrative challenges, economic challenges, challenges specific to the start-up phases of EPR programmes, and the new and emerging challenges.

The OECD is considering the following challenges in implementing EPR schemes:

Governance and administrative challenges

Governance of an EPR scheme refers to the overall set-up of the system and the allocation of responsibilities among stakeholders. Policy makers have a key role to play in clearly defining the respective roles and responsibilities of municipalities, PROs, producers, and consumers, and to ensure that these are enforced. Below is an overview of the main governance and administrative challenges that have been encountered in EPR schemes.

- Unclear and overlapping roles and responsibilities of different actors, including the relationship between public bodies and PROs. As highlighted above, the allocation of responsibilities among stakeholders (PROs, producers, importers, collectors and recyclers, municipalities, consumers) varies significantly among schemes. The role assigned to every actor depends on diverse factors such as the overall objectives of an EPR scheme, the pre-existing infrastructure and waste management practices, the mix of policy instruments implemented and the products targeted. The challenge for policy makers will be to assign specific functions to each stakeholder while avoiding as much as possible any overlap and loophole. Indeed, the frontiers can sometimes be unclear between the responsibilities to collect and recycle, to finance the scheme, to set and enforce the targets, to ensure surveillance and compliance, and to produce awareness campaigns. Overlaps may for example arise in the case of partial organizational responsibility as producers, municipalities and waste management operators are all in charge of some aspect of the collection and treatment activities. On the contrary, certain schemes may contain loopholes if roles are not clearly and adequately defined, which can lead to free-riding. In certain cases, it might also be difficult for policy makers to identify which actor in a value chain should be considered as the "producer". In the context of the 2001 OECD Guidance, the producer was considered to be the brand owner or the importer, except for certain cases such as packaging where the filler of the packaging rather than the firm that produces the container would be considered the producer.
- A lack of transparency and difficulties in the comparability of data. PROs have often been criticised for providing limited public information on their economic data and on the costs faced by producers, recyclers and municipalities. This lack of transparency is not necessarily intentional and can result from unclear and diverse reporting modalities and calculation methods. A key challenge for policy makers is to determine the appropriate level of public information to be required from PROs and producers since full transparency can be difficult to implement in some sectors and may hinder competition on the market. A certain level of information is however necessary in order to assess the effectiveness of EPR schemes in place and possibly review the targets. Transparency on costs is also critical for producers and municipalities in order to make informed decisions on which PRO to choose when several options exist. Finally, transparency and the harmonization of definitions and reporting modalities are essential to allow international comparison of data and peer-reviews. In order to ensure surveillance on all actors, a two-tiered audit system was for example introduced in Austria for packaging waste. Under that system, an Austrian governmental agency is designated to act as a clearing house, assuming data collection and monitoring on producers and PROs, who are themselves in charge of auditing the collection and recycling operators with whom they contract.

- Concerns with free-riding. Free-riding refers to situations where some producers do not adequately comply with their obligations under EPR. This happens for example when some producers do not finance the collection and recycling of their products up to the level required. Free-riding could also refer to non-compliance, for example if producers do not provide accurate data about the quantities of products put on the market. These situations arise more frequently in collective schemes, because responsibility is shared and it is easier for producers to circumvent their respective obligations. Free-riding issues are expected to happen more often in markets with many competitors that are more difficult for policy makers and PROs to monitor. Other issues that are likely to exacerbate the issue of free-riding are the increases in international trade of waste and in online trading of products.
- A lack of enforcement mechanisms. A number of issues that threaten the good functioning of EPR require permanent monitoring and control by public authorities. These issues include free-riding, competition concerns, illegal landfilling, exports of waste and used products, lack of transparency on costs and of traceability for certain products. However, policy makers may sometimes lack the adequate enforcement means and sanctioning options that are necessary to guarantee compliance
- Concerns with collective schemes (PROs). Producers generally favour collective schemes with PROs over individual schemes, because of the business advantages that they present. Collective schemes are indeed considered to be cost efficient for producers by building on economies of scale, and to facilitate the centralization and exchange of data. However, PROs also pose a number of challenges that make compliance and enforcement of EPR more difficult. Shared responsibility under collective schemes may lead more frequently to free-riding issues and decrease incentives for eco-design investments by individual companies.

Economic challenges

Given that EPR policies go beyond end-of-life and address different aspects along the value chain of a product, they may also have broader and unintended impacts on the market. The economic challenges outlined below highlight some of the main adverse effects that EPR schemes could have on local, national and international markets. These effects are generally difficult to quantify precisely and so it can be difficult to measure them against the expected economic and environmental benefits of EPR.

- Trade and competition concerns. The multi-stakeholder nature of EPR and its ownership by private entities make the system potentially prone to trade and competition concerns. These issues can arise at different levels:
    a. Product market competition: When producers choose to meet their obligations collectively through a PRO, their decisions may have impacts on the corresponding product markets. In particular, if they agree collectively on the fee passed on to consumers for handling waste, this would reduce price competition for the original products. EPR may also differently affect producers themselves and their respective competitive position. It can for example be more onerous for small and medium sized producers to contribute to a scheme. Certain products may also be favoured over others through differing EPR rules and tariffs, which could disproportionately affect costs of production and put certain producers at a disadvantage. This can typically be the case for foreign firms, which have to understand and comply with various regional and national schemes that put them at a competitive disadvantage.
    b. Competition among PROs: A competitive PRO market can generate cost efficiency and stimulate technological developments. On the other hand, single PROs operating in a market may be efficient by benefitting from economies of scale and facilitating administrative oversight, including tackling free-riders. Monopolistic PROs could however lead to abuses of dominant positions when producers are subject to high fees and conditions unilaterally imposed by the PRO, with no other options available. This can also happen when several PROs engage in illegal collusion among themselves to fix higher prices together. In addition, when a single PRO operates in a market and has

already developed capacity for a range of waste management services, the barriers to entry into the market are high for new entrants as it requires high investments in collection and recycling infrastructure from the start.

c. Competition among PROs and the waste collection markets: The market for collection services is generally a natural monopoly. Indeed, the existence of large economies of density makes it more efficient to have one single waste collector per area. Lengthy exclusive agreements between a PRO and collection providers is however likely to disrupt competition on the waste management market and make the entry of competing PROs and collectors difficult. The introduction of competitive tendering to choose the providers of collection services has been seen to lead to significant cost reduction for PROs. In Germany, the European Commission decided that the duration of DSD's exclusive agreements with local collection companies of up to 15 years was excessive. Eventually, the introduction of competition for collection and sorting services for DSD resulted in reductions of more than 20% in the costs of these activities. Under certain schemes, the entire provision of waste management services is vertically integrated through exclusive agreements and monopolies, which is likely to decrease efficiency and hamper waste collectors and sorters to compare and switch schemes. This was for example the case under the Spanish glass packaging scheme, which in 2010 the Spanish competition authority ruled to be anti-competitive and discriminatory against non-members.

d. Competition between PROs and recycling/recovery providers: Contrary to waste collection markets, recovery markets enjoy large economies of scale and are usually more competitive. Exclusive arrangements between PROs and recyclers for example through the establishment of vertically integrated schemes may however hinder competition on the market. This may hamper the survival of recyclers that are not part of the agreement, and impede the entry of new competitors on the market. In addition, competitive tendering has also reportedly contributed to the development of new recycling technologies, suggesting that the guarantee of large scale demand helped to overcome entry barriers.

- Difficulty to implement differentiated fees and lack of incentives for DfE. The rationale behind EPR is that producers pay for the post-consumer costs of their products and hence have an incentive to minimise those costs through better product design. In the case of individual schemes, single producers directly pay the full costs for waste management for their products. It is however more difficult in the case of PROs to charge a specific fee per producer that corresponds precisely to the quantity of material put on the market, and therefore to their actual recycling costs. If PROs apply identical fees on all producers, this would amount to averaging waste management costs among producers and thus reduce incentives for DfE investments. In practice, however, it can be very difficult to implement differentiated fees proportional to the actual waste management costs, because of the difficulty to disaggregate treatment costs to the level of products. In addition, price fluctuations of secondary raw materials make it difficult to correctly assess revenues from recovered products on a long-term basis. Another limitation lies in the increasing role that multinationals play in certain product markets. Corporations that design and market essentially identical products at a global level will be less inclined to modify product designs for a specific market and the impact of relative changes in the fees applied by one EPR scheme may therefore be limited.
- Different understandings of full cost recovery. The financial responsibility of producers under EPR often implies that they bear the real full costs of managing the end-of-life of their products in order to optimize costs and environmental performance. There is no consensus on what these costs shall cover and on what an efficient allocation of costs between producers and municipalities would be. Under most EPR schemes PROs cover the general net costs of waste management i.e. costs for collection, transport and treatment of waste minus revenues from recovered materials. These net costs are not always easy to evaluate as they depend on a range of factors including the infrastructure and technology level, the quality of public services, and price fluctuations of secondary materials. In addition, the concept of "full-cost" could also refer

to a range of additional expenses, such as the costs for public communication and awareness campaigns, the costs for waste prevention measures, and the costs for enforcement and monitoring of the scheme. Certain expenditures might be more important in specific phases of the development of the scheme. For example, communication campaigns would likely require higher investments during initial stages.

- Difficulty to assess the cost effectiveness of EPR policies. The wide disparities in fees and cost coverage across EPR schemes have raised concerns among governments and policy makers to the issue of cost effectiveness. Indeed, the variations as to what is included in full costs and what share of the costs will be assumed by producers make it challenging to assess the cost effectiveness of a specific scheme. In addition, all EPR programmes have specific scopes, objectives, and accounting and reporting modalities, which hinder their comparability. In that context, it can be challenging for policy makers to determine an adequate cost-effectiveness assessment of a new or existing EPR programme, especially as the expected benefits of EPR (e.g. DfE, increase in recyclability, correction of market failure such as ineffective recycling markets) are also hard to quantify.

Issues specific to EPR start-up phases

A number of specific issues may arise when developing a new EPR programme. In many countries, the initial development and start-up of EPR programmes is a more comprehensive issue that often requires a transition from informal to formal waste management. This shift requires important investments in human, physical and financial capital in developing countries with rudimentary and unsafe waste management systems, and sub-standard technology levels. In addition, the necessary administrative and institutional capacity required to adequately deal with waste and to ensure enforcement of EPR policies needs to be established. Some key challenges policy makers are likely to encounter when developing new EPR programmes are:

- Informal waste management sector and social challenges. Unauthorized facilities and illegal recyclers are present in most markets. Given that informal actors do not have to comply with safety and environmental standards, they can operate at relatively cheaper costs and be more profitable than official recyclers. The use of inappropriate techniques by informal actors leads however to high environmental risks and loss of valuable material in the process. In addition, the presence of unofficial actors raises challenges for the good functioning of EPR schemes given that waste covered by the scheme is sometimes diverted into informal facilities. It is usually producers whose products are most easy and profitable to recycle who will be less likely to recover their materials; thereby de-incentivizing DfE innovations. These losses are expected to proliferate as more and more waste is considered to contain net positive value. This challenge is particularly large in developing and emerging economies where informal recycling has developed as a large and sometimes lucrative activity. The informal recycling usually provide a livelihood to the poorest sections of the population who are often unaware of the harmful and irreversible impacts of waste for their health and the environment.
- Waste leakage. Leakage of waste products occurs when they are not being captured by the EPR scheme, but instead collected and treated through other legal, or illegal, channels. Illegal leakage can be due to the activities of informal recyclers or to the illegal exports of waste, usually for waste that has positive value. Leakage also occurs when used products are exported, which is not illegal but still results in a reduction of material that can be recovered through the EPR scheme. In addition, leakage may cause severe environmental and health damages, when leaked products are disposed of in an un-environmentally sound manner.
- Orphan products and free riders. A new EPR scheme may be confronted with products whose producers did not contribute to the scheme or cannot be identified, leading to inadequate levels of finance to handle end-of-life costs. One such category is orphan products, which were put on the market before the introduction of EPR systems by producers who are no longer in business, thereby leaving the responsibility to finance their treatment to current producers. A similar problem arises when there is a large share of free riders, i.e. producers who do not pay

their fees at an adequate level. The issue is exacerbated in markets where it is difficult to identify manufacturers, especially in emerging economies characterized by large counterfeiting and second-hand sectors and illegal importers. These challenges are often especially present during the first years of establishment of an EPR scheme given that past producers would not be covered. Internet sales by-passing EPRs is another issue that requires a particular concern with regard to freeriding. The rise in internet sales is a clear challenge for EPR in all countries, where online markets are beginning to achieve significant market share. Products sold online frequently free ride on EPR systems. This phenomenon is especially noticeable among small-scale internet sales companies that are difficult to identify and can more easily act as free riders. This puts national producers who are contributing to EPR schemes at a competitive disadvantage.

- Absence of a business framework that is conducive to investment. A stable and effective EPR system requires the presence and development of efficient and competitive waste management operators and of markets for recovered material. However, during the first years of development of a scheme, uncertainty about the volume of waste that will be collected by producers and PROs hampers future investment planning by recyclers. As waste leaks out of the official scheme and is processed by informal actors instead, it becomes more difficult for waste operators to recover their infrastructure investments and to operate legally at a profit.

The different alternatives to implement EPR schemes for packaging waste and WEEE in FBiH are presented in the following section.

7 ANALYSIS OF POSSIBLE ALTERNATIVES FOR IMPLEMENTING EPR

The establishment of EPR system for packaging waste proved its efficiency in many countries. Nevertheless there is no unique best solution that can be directly transferred to other countries. The various EPR systems differ significantly from each other and they were gradually developed and adapted to fit with the needs of the individual countries. The EPR system shall take into account the specific conditions in place, especially geographical conditions, level of economic development, legal system, current level of waste management services, people behaviour and standard of living, existence of recyclable waste markets, etc.

It shall be noted the EPR systems are not a magic solution for all potential problems in recyclable waste management.

The major role of EPR system is to provide an additional financial stream in support of packaging waste recycling and recovery. It can also bring valuable knowledge how the recyclable waste collection and sorting to be organized and also to provide guarantees that the collected materials will be recycled. Considering that the EPR system is organized by the private sector it is usually more flexible and efficient than state institutions in organizing waste management services.

The possible alternatives for organizing EPR scheme for packaging waste and WEEE are analysed regarding following characteristics:

- Responsibilities for organizing the system
- Scope of the system with regard to materials and territory covered
- Competition on market
- Division of responsibilities between the EPR scheme and local authorities
- Financing of the system

When considering the different implementation alternatives it shall be taken into account that a solution that seems to be optimal for the packaging waste management cannot not be appropriate for the

management of WEEE and opposite. In this respects the recommendations can differ for the different waste streams considered.

7.1 Responsibilities for organizing systems for the management of packaging waste and WEEE

The responsibility to organize the management of packaging waste and WEEE is usually delegated to the responsible industry and implemented through PRO. Nevertheless, there are few examples of waste management schemes organized by the state. The section below provides an analysis of a system managed by an entity Environmental Protection Fund based on product taxes paid by the obliged industries.

7.1.1 Public Fund managed scheme

The present chapter provide an analysis of the possibility to implement a public fund management scheme for packaging waste and WEEE in FBiH/RS.

Examples of product taxes imposed on packaging waste in EU countries are presented in the following table.

Table 7-1: Product taxes for packaging placed on the market in several EU countries

Material	Croatia	Bulgaria	Hungary
	The Environmental Protection and Energy Efficiency Fund (EPEEF)	National Environmental Protection Enterprise	National Tax and Customs Administration
	EUR/kg	EUR/kg	EUR/kg
Glass	0.0201	0.102	0.061
Paper, cardboard	0.0503	0.343	0.061
Metal (Steel)	0.0302	0.066	0.061
Aluminum	0.0550	0.307	
PET	0.0550	1.191	0.184
Plastic bags	0.2013	0.28 EUR/pcs	6.137
Other polymeric materials	0.1006		
Other polymeric materials (milk and dairy products)	0.0550		
Beverage cartons	0.0550	0.885	0.061
Other composite	0.1006		0.184
Wood	0.0201	0.205	
Textile	0.0201	0.409	0.184
Other fees for packaging for drinks for the volumes bigger than 0,2 L (PET, AL, Fe, glass)			
· Waste disposal fee per packaging 0,10kn	0.0134	-	-
· Refundable fee 0,50kn per packaging	0.0671	-	-

The implementation approach to apply product tax on packaging placed on the market in Bulgaria is different from the systems applied in Hungary and Croatia.

In Bulgaria, the companies who have signed contract with the PRO are exempted from the obligation to pay a product tax. In this way the product tax in Bulgaria has similar function like fees for non-achievement of targets applied in FBiH and RS.

According to the legislations in Hungary all companies are obliged to pay an environmental tax (official name: environmental product charge) to the National Tax and Customs Administration (abbreviated Hungarian name: NAV). The object of the charge is the packaging material instead of the packaging and therefore packers are directly not subject of the law for domestic products. In case of products produced abroad the importer company is responsible for the charge, i.e. the company who imports, and sells the product in Hungary at the first time (with the first HU-VAT Nr. invoice), or uses it for their own purposes.

The following scenario for a public fund managed scheme can be considered for FBiH and RS. The system can be implemented independently in both entities.

The obliged companies report the packaging quantities placed on the market in FBiH/RS and pay a product tax to the respective Fund. The revenues collected will be used to develop the necessary separate collection and sorting infrastructure and finance the implementation costs.

The municipalities will be entirely responsible for the development of household collection scheme for packaging waste and certain categories of WEEE.

Under this alternative, the following operational model is assumed:

Financing of initial investments

The Fund will provide fully or partly the financing of initial investments on project basis and according to application submitted by local authorities. Standard requirements for separate collection systems shall be developed, including type of eligible equipment and costs, container volumes provided per capita, collection frequency, costs per capita, etc.

Direct financing of initial investments by municipalities and/or PUCs shall not be expected based on limited financial resources available.

The financing of investment costs for sorting facilities could also be provided on project basis. Considering that such sorting facilities will usually serve more than one municipality the respective inter-municipal cooperation agreements shall be in place.

Financing of operating costs

Different possibilities for the financing of operating costs are available:

- The operating costs can be financed directly by municipalities/PUCs based on fees charged to households and taking into account the revenues from the sales of recyclable materials. In this case the implementation of separate collection system will lead to an increase of municipal waste fees.
- The municipalities/PUCs can be reimbursed for the occurring net operating costs for collection and sorting of packaging waste. The payments from the Fund shall be based on quantity of waste sorted for recycling. Prior the payment the PUCs/municipalities shall be required to submit evidences for the quantities of waste collected separately, sorted and delivered for final processing. The payments per tonne for the different types of packaging materials shall be same for all municipalities. Differentiated payment for rural and urban areas can be considered as

possible option. Payment of additional bonuses to municipalities for the achievement of minimum separate collection and recycling rates is advisable.

- Payments of the exact amount of operating costs will practically not be possible because of the huge administrative efforts to estimate and audit the actual costs on case by case basis and the fluctuations in the prices of recyclable waste commodities (revenues in the system) and/or treatment and disposal costs.

Financing of recycling and treatment costs

- In principle, the Fund shall not finance investments of municipalities or private sector into establishment of new recycling infrastructure. The recycling of waste shall rely entirely or private initiative and will be developed on commercial and competitive basis.
- Some of the collected WEEE like luminescent lamps, TVs, etc. have a negative value. The Fund will have to pay the related transportation, dismantling, treatment and disposal costs. The contracting of these services will be based on open tender.

Communication and public awareness

- The Fund shall provide support for the financing of educational and public awareness campaigns in the support of separate collection programmes

Dealing with commercial and industrial packaging

The Fund can play a limited role in organizing and/or improving practices for separate collection of commercial and industrial packaging waste. The majority of these wastes are collected from private dealers independently from the municipal waste collection system. The role of PUCs in separate collection of commercial packaging is very limited at present.

One option is to assume that the Fund will not provide any financing to support separate collection and recycling of commercial and industrial packaging. The separation at source and transfer of waste for recycling will be an obligation of the waste generators. The large generators will continue to transfer their waste to private collectors while the small shops and industries will most likely start to use the separate collection systems organized by the municipalities.

The disadvantage of this option is that in this case, the private sector involved in collection of recyclable waste will not have access to additional financing and the collection process will be entirely driven by the value of the collected material. In the future, any significant drop in the prices of recyclable waste commodities will practically terminate the collection process.

The same applies for the materials collected from informal sector.

In case that no financing to support recycling of commercial and industrial packaging is provided it will not be fair to charge the same amount of product tax for the commercial and for household/consumer packaging. Differentiation of product taxes based on packaging type shall be considered.

The second alternative is the Fund, to pay a small fee for each tonne of packaging waste or WEEE delivered for recycling or exported. Any company who has the necessary registration or permit for dealing with waste shall be able to claim the fee to the Fund based on evidence documents proving the recycling or export of waste. The size of the fee shall be differentiated for the different packaging waste materials and shall not exceed the value of the material. The fee for WEEE shall be determined per category of equipment.

Private sector involvement

Under the Fund managed scheme the municipalities/PUCs will be the major beneficiaries of funds for development of separate collection systems for packaging waste and WEEE with household origin.

The private sector involvement is possible under the contract with the respective municipality.

The Fund has limited possibilities to operate directly with the private sector. In this case, the Fund shall take the operational responsibility for organizing separate collection and sorting services and this is not considered realistic scenario.

Any payment from the Fund to the private sector shall follow the public procurement rules.

Specific issues related to WEEE management

It will be difficult for the Fund to organize the collection of WEEE through large retail shops.

Considering the possibility the Fund to establish scheme for WEEE the following shall be taken into account:

- Significant part of the population is living in rural areas.
- Some of the collected WEEE like luminescent lamps are considered hazardous waste and the value of these materials is negative. There are no available recovery or disposal capacities in the country and the waste shall be exported for final treatment. The export of hazardous waste cannot be organized independently from each individual municipality or PUCs. For that reason there is a need for an intermediate structure to accumulate all WEEE collected entity level, sign the necessary contracts for final disposal and organize the export. The Fund cannot organize this service directly. Tendering of these services is difficult as there is no guarantee
- Distributors of domestic appliances can offer to take back the old appliance at the time of delivery or at the place of sale. These services are usually organized independently from the local authorities.
- There is no problem the Fund to organize payments for WEEE collected from the municipalities
- How the treatment and disposal costs will be financed
- Centralized storage for WEEE prior the export
- Permitting system for dismantling and processing of WEEE
- How to record the quantities of different WEEE categories
- The municipalities (or the Fund) shall establish a new public entity to deal with WEEE or these services shall be contracted to private sector based on tender.

Advantages

The main advantages of the Fund managed scheme can be summarized as follows:

- More easy to administer from the state point of view (no need of licensing of PRO and control of its activities)
- Less complicated institutional and organizational arrangements
- Theoretical potential for economies of scale because of sharing municipal infrastructure used for collection and sorting of residual waste.
- Development of public separate collection and sorting infrastructure will be guaranteed based on the revenues in the Fund and grant financing provided to municipalities. Nevertheless, the availability of infrastructure is not a guarantee for its efficient operation.
- The Government, through the Fund and municipalities will take the financial risks for developing the necessary infrastructure. This can speed up the process.

Possible disadvantages

The disadvantages of the Fund managed scheme are significant:

- The size of the tax do not address the actual costs for separate collection, sorting and treatment.
- Overspending of funds. The majority of the expenses will occur for the financing of separate collection and sorting infrastructure to be developed by the municipalities. Investments in unnecessary, inappropriate or oversized facilities are likely to occur.
- Possible spending of funds for other purposes.
- The achievement of recycling and recovery targets is not guaranteed. The Fund cannot be held responsible for non-achievement the targets.
- The Fund has less experience in trade with recyclable waste commodities compared to the private waste management companies.
- The Fund shall take the entire control over the declared quantities of packaging placed on the market. Considering the present level of free-riding this will be a challenging task.
- The State organization as a presumption is less flexible than private sector.
- The contribution paid to municipality shall take into consideration the revenues from the sale of recyclable waste.
- Contracting of private companies to operate the separate waste collection and sorting will be practically not possible for the Fund because of the complicated public procurement procedures. Most likely the majority of the funds will be channelled through municipalities and respectively designated to PUCs. Considering that local authorities have serious difficulties in organizing collection, treatment and disposal of (residual) municipal waste, it's very unlikely they to be more successful and efficient in developing separate waste collection and sorting of recyclable waste on their territories.
- Financing of recycling infrastructure can be expected.
- The major experience of the Fund is related to project financing and management. This is quite different from the packaging waste or WEEE system where the operating costs shall be financed.

Considering the above, **the implementation of public fund managed schemes for packaging waste and WEEE is not recommended for implementation in FBiH and RS**. Nevertheless, considering the current issues with the functioning of PRO for packaging waste in the RS, this alternative shall not be completely rejected.

The following sections present the different aspects for implementing EPR system organized by the obliged industry.

7.2 Full or shared responsibility of PRO

The PRO is the main element for the implementing the EPR system.

The PRO is a collective compliance scheme established on behalf of the industry, responsible for the organizing of separate collection and achievement of recycling and recovery targets on behalf of producers and importers of packed goods on FBiH/RS market.

In the implementation of these duties the PRO interacts with various stakeholders such as producers and importers of packed goods, state and local authorities, waste management companies, recycling plants and citizens using the separate waste collection services. The key relations of PRO with the different stakeholders are presented on the following figure.

Figure 7-1: Producer Responsibility Organization

The municipal administrations are formally responsible for organizing the separate collection of recyclable waste from the households on their territory.

The decision about the distribution of responsibilities between the PRO and the local authorities in organizing separate collection and sorting of packaging waste and for the collection of WEEE from households is crucial for the entire functioning of the system.

As already explained the role of PRO can be limited to financial responsibility or alternatively the obliged industry will have also responsibility to organize and implement the necessary separate collection and sorting services.

The Table below presents these possible alternatives for organizing the system based on full and shared responsibility between the PRO and local authorities.

Table 7-2: Packaging waste management organizational alternatives

Function/activity	Full responsibility of obliged industry	Shared responsibility between industry and local authorities
Responsibility for organizing separate collection	Obliged industry through PRO	Municipalities
Decision about the type of separate collection system	PRO in consultation with the municipality. The municipality has to agree and approve the elements of the separate collection system (e.g. location of container sites)	Municipality The municipality has the final decision about the type of separate collection system to be implemented
Contract between PRO and local authority	Required. Defines the right of the PRO to implement the system on the territory of municipality	Required. Defines the relations between the PRO and municipality, including reimbursement of costs for separate collection and sorting
Financing of initial investments for	The separate collection containers are financed and owned by the PRO.	Financed by the local authorities, PUCs or private

Function/activity	Full responsibility of obliged industry	Shared responsibility between industry and local authorities
separate collection containers and collection vehicles	The collection equipment is provided by the operator contracted to perform the separate collection services. Financing of the entire investment by the service contractor is theoretically possible.	sector (based on contract with local authorities) The PRO can provide financing for purchasing of separate collection containers
Payments from PRO to municipality	none	Payment of costs for separate collection and sorting of packaging waste. The payment is usually per tonne of waste collected and sorted for recycling. Additional bonuses can apply in case of achievement of preliminary specified objectives (e.g. threshold quantities collected per capita served)
Contracting the separate collection services	PRO. The contracting can be based on tender. The PRO can contract PUC for providing service Payment is usually per container lifted and agreed collection frequency. Alternatively, the contractual payments can be based on quantity collected or residents served	Municipalities (or cantonal administration) The separate collection is organized in a similar way like the collection of residual waste. Several neighbouring municipalities can tender/contract together the separate collection services
Ownership of separately collected waste	PRO	Municipality/PUC/Operator
Financing of initial investments for construction of sorting facilities	Private sector contracted to provide sorting of separately collected waste. PUCs can be contracted by PRO on competitive basis PRO can finance part of the sorting equipment and then transfer (or rent) it to the facility operator	Municipality/PUC (if service is not contracted to private sector) The existing municipal infrastructure (sorting facilities) can be used for sorting of separately collected waste
Contracting the sorting services	Contracted by PRO Payment can be based on quantities of input material (unsorted separately collected waste) or on sorted output (quantity of sorted fractions) The payment according to output is preferred option because it's based on actual quantities. Nevertheless, there is a risk the operator of the sorting plant to steal recyclable waste because the sorting price per tonne is lower than the value of sorted materials	Contracted by the municipality or PUC or performed directly by PUC

Function/activity	Full responsibility of obliged industry	Shared responsibility between industry and local authorities
	Minimum sorted quantities can be agreed (defined as a percentage of the input material)	
Financing of operating costs	PRO The operating costs are calculated in the prices charged by the operators of separate collection and sorting services	PRO or shared between PRO and municipality (depending on the size of agreed payment per tonne of recycled material)
Ownership of sorted recyclables	PRO	Municipality/PUC
Sales of recyclable materials	The PRO sales the sorted recyclable waste for final processing and receives the revenue	The PUC or private operator of the sorting plant sales the material on behalf of PRO but for its own account The revenue is received by the operator of the sorting plant
Issues related to multiple PRO operating in FBiH	Only one PRO can operate on certain territory. The territory or population served in FBiH shall be divided between all PROs operating on market Large cities can be divided to service areas contracted by different PRO Competition between PRO to sign contracts with bigger municipalities is expected	The payments to municipalities (service operators) are divided between all licensed PROs proportionally to their market shares. A clearing house can be required in this case. or Each municipality has a contract with only one PRO and the total number of residents served in FBiH is divided between PROs proportionally to their market share
Other conditions	The alternative presumes larger involvement of private sector in the delivery of separate collection services The disposal of sorting residues shall be agreed in the contract signed between PRO and municipality. The PRO shall not pay disposal fees considering that the sorting residues present municipal waste.	The municipalities shall guarantee an achievement of certain minimum collection rates Issues with damaged or lost containers (in case that provided by PRO) shall be addressed in the contract with municipality. Difficult to define responsibilities for the financing of the system in case that more than one PRO is operating on market (clearing house can be required) It is desirable same (or similar) conditions to apply to all municipalities (same fee per tonne of waste collected)
Risk allocation	All risks are covered by the obliged industry (PRO). Part of the risks can be transferred to the operators of separate collection and sorting services based on the signed contracts	The risk are shared between municipalities and PRO The payment received by the municipality can be below the actual costs if separate collection does not achieve the

Function/activity	Full responsibility of obliged industry	Shared responsibility between industry and local authorities
		agreed objectives. In this case the municipality shall cover the costs from its own budget or through the municipal waste fees The risks related to the fluctuations in prices of recyclable waste commodities are borne by the municipality
Advantages	The obliged industry is entirely responsible for the system More simple to administer (no special need for clearing house) Better cost efficiency due to the business to business contracts No need for public investments No negative impact on the municipal waste fees	Possible use of municipal infrastructure (cost sharing) Larger involvement of municipalities that is beneficial from the industry point of view Better coordination with other municipal waste services Better enforcement of separate collection requirements at local level
Disadvantages	Limited involvement of local authorities Competition between the PROs to sign contracts with municipalities with low service costs (usually large settlements) No interest of PRO to sign contracts with small municipalities	The PUCs/municipalities have limited financial resources to finance initial investments The majority of services will be provided by public sector (higher costs, low efficiency) Significant risks and potential costs implications allocated to municipalities

Comparing the above alternatives an **EPR scheme based on full responsibility of the obliged industry is considered more beneficial for the future implementation in FBiH and RS**. The arguments supporting this recommendation are following:

- The municipalities and PUCs have very limited experience in organizing separate collection and sorting
- The municipal infrastructure for separate collection is practically not available
- The municipalities are resistant to changes and the public sector is less flexible to accommodate to the change in situation
- In case that municipalities fail to organize the separate collection it will affect the achievement of recycling and recovery targets
- The municipalities have limited experience in the trade with recyclable waste commodities. The revenues in the system will be lower compared to the system operated by the private sector. In addition, the majority of sorted waste will be exported for recycling abroad and this will cause additional difficulties to the public sector.
- The private sector can deal better with unfair trade practices and corruption

The full responsibility of industry to organize the separate collection and sorting will not limit the PUCs to participate in the provision of services on competitive basis.

As mentioned above the model based on full responsibility of the obliged industry seems to be more beneficial for implementation. Nevertheless, it shall be taken into account that a shared responsibility model was successfully implemented in several EU countries. Considering the present organization of

municipal waste services, the shared responsibility model will provide substantial support and additional revenues to Public Utility Companies. It will also allow for better utilization of public municipal waste infrastructure that could be used for sorting of separately collected waste. At the other side the full responsibility model, suppose larger involvement of private sector in the service delivery.

Another possibility is the legislation to allow the implementation of both alternatives and the cooperation modalities to be decided on case-by-case basis in the agreement signed between the PRO and the respective municipality.

7.2.1 Cost coverage

The full responsibility of the obliged industry suppose the PRO to cover the full costs for organizing separate collection and sorting of packaging waste.

When covering the full costs the following shall also be taken into account:

- The separate collection and sorting systems organized by the PRO deal also with other non-packaging materials (mainly printing paper and newspapers put into the separate collection containers).
- There is significant percentage of impurities in the separate collection containers (waste that cannot be recycled, residual waste).

This leads to additional collection/sorting costs for the PROs.

At the same time, the municipalities could have some savings because the separately collected packaging waste does not use municipal waste collection and disposal infrastructure.

Despite that, this system seems to be in favour of municipalities, there are no sufficient arguments for the PRO to ask for partial coverage of costs for non-packaging recyclable materials and for collection of residual waste, because of the following reasons:

- The allocation of costs between the PRO and the municipalities will require significant administrative efforts;
- Significant part of packaging waste remains into residual municipal waste stream and the related collection and disposal costs are covered through the fees charged to households and legal entities for the services organized by the municipalities.

In order to balance these additional costs for the PRO, the municipalities shall not charge fees for sorting residues delivered on behalf of PRO at the municipal waste landfills, provide support in the enforcement of requirements for separate collection and actively participate in public awareness campaigns implemented on their territory.

In case of shared responsibility between the obliged industry and municipalities, a cost sharing is also possible. The PRO will still cover the major part of the costs but the municipalities will have to cover the costs for non-packaging recyclable materials collected through the separate collection system.

It also shall be pointed out that the PRO will apply standard and unified requirements for all municipalities and the implementation of individual conditions for each municipality will not be possible and difficult to implement. In practice, this will mean that the different municipalities will receive from PRO the same payment per tonne of packaging waste collected, sorted and delivered for recycling. A more fair solution could be to categorize municipalities in several groups based on the population size and density and the type of separate collection system established and then provide same cost sharing and payment conditions for all municipalities within the same group.

Even in this case, the actual costs for separate collection and sorting will be different in different municipalities because of the different population size, distances to the sorting facilities, distances to the recycling plants, consumer behaviour, collection rate achieved, sorting efficiency, etc.

Receiving same payment per tonne will mean that some municipalities will be able to cover the full costs for the organized separate collection services while in others the revenues received from the PRO and from the sales of the recyclable materials will not be sufficient to cover the full costs. In this case the separate collection costs shall be partly financed through the fees charged to households or through transfers from municipal budget. Overpayment from PRO to municipalities is also possible but unlikely.

The other issue when applying shared responsibility model is that the costs to implement a separate collection system, the revenues from the sales of recyclable materials and the treatment and disposal costs for certain WEEE categories will change over time. In order to guarantee a financially sustainable functioning of the system an appropriate price adjustment mechanisms shall be agreed between the PRO (obliged industry) and the municipalities.

Considering the limited financial resources of the municipalities and PUCs the sharing of costs for the implementation of separate collection and sorting is not considered an appropriate approach for the coming years.

In addition, the existing practice to finance the administrative costs occurring for the entity authorities through fees due by the obliged companies to the Fund shall be supported. In order to reduce the administrative burden the PROs will have to pay the administrative component of the fees on behalf of their members.

7.3 System scope

The other main issue that need to be solved is to decide about the materials that have to be collected and the territorial coverage of the services provided.

7.3.1 Household vs non-household packaging

In few EU countries the scope of collective systems to household packaging is limited to household packaging in others it involves all packaging materials (e.g., Germany). In other Member States, collective systems may be set up both for household and commercial packaging (e.g., Austria). In the latter case, legislation sometimes requires a separation of the cost structures of the household and the commercial sector (e.g., Austria). In Belgium two PRO operate separately for household and commercial packaging.

The present legislation in FBiH does not limit the responsibilities of PRO to certain categories of packaging.

When planning future waste management activities the following shall be taken into account:

- the separate collection and recycling of household packaging waste is practically not developed at present and this is the main argument of the authorities in both FBiH and RS to question the efficiency of the EPR systems in place. The achievement of recycling and recovery targets relies entirely on the commercial and industrial packaging waste collected and the materials delivered by the informal sector. In this regard, the EPR system operating for more than five years in FBiH didn't provide substantial contribution for the improved recycling.
- The present recycling and recovery targets are considerably below the levels prescribed in relevant EU legislation. The increase of targets to comply with Packaging Waste Directive will require gradual implementation of separate collection systems for household packaging waste.

- The major role of obliged industry and PRO will be to support the implementation of household packaging waste separate collection system and in this way increase considerably the amount of recycled waste.
- The achievement of such objective will require setting up clear objectives and obligations for the PRO to develop, organize and finance the separate collection system.
- The following policy and legal measures are possible:
  - to limit the responsibility of PRO to household packaging
  - to set separate targets for recycling and recovery of household packaging waste
  - to set minimum requirements and objectives for the separate collection systems for household packaging waste that have to be achieved by the PROs.

The possible implementation of the above policy measures is considered below:

Limiting the responsibility of PRO to household packaging

According to this scenario, the PRO will be responsible only for household (consumer) packaging. The responsibility can be limited to the financing of the systems organized by local authorities.

The recycling of commercial and industrial packaging can be achieved through the following ways:

- Delegation of responsibility for recycling and recovery of the commercial packaging to waste generators. Such responsibility can be formulated as obligation for any company as a result of which activity packaging waste is generated to implement separation at source and ensure that packaging waste is periodically transferred to a specialized collection or recycling company. If necessary, the generators should have signed contracts for the collection of sorted waste fractions and pay for the received services.
- Establishment of separate EPR scheme for industrial and commercial packaging. That means different PROs will be licensed for household and for commercial/industrial packaging. The obliged companies will have to report the quantities of household and commercial packaging separately and have separate contracts with two PROs. One PRO can receive permit only for one packaging category.

If shared responsibility model is implemented, the major role of PRO will be to finance or organize the separate collection systems for household packaging.

The quantities of packaging waste collected from informal sector can be considered as household packaging upon certain conditions (e.g. waste delivered to recycling centres organized by municipalities).

The major difficulties or disadvantages of such approach are the following:

- It's very difficult to distinguish between certain household and commercial packaging items.
- A separate reporting of household and commercial packaging will be required
- It's common practice to collect together household and commercial packaging (e.g. small shops and kiosks usually use the collection systems established by the municipalities)
- Collection of data about the industrial and commercial packaging collected and recycled will be complicated.
- The data about the recycling of household and commercial packaging shall be aggregated at national level in order to calculate the achievement of general and material specific targets at national level.
- Establishment of separate EPR scheme for industrial and commercial packaging. That means different PROs will be licensed for household and for commercial/industrial packaging. The obliged companies will have to report the quantities of household and commercial packaging

separately and have separate contracts with two PROs. One PRO can receive permit only for one packaging category.

Setting up separate targets for recycling recovery of household packaging

Under this alternative, the obliged industry remains responsible for the recycling and recovery of all packaging placed on the market in FBiH or RS.

Targets for recycling of household packaging have to be defined in the legislation in addition to the general and material specific targets.

The implementation of this approach will require the packaging waste from different origin (collection channels) to be reported separately. The costs structures for household and commercial packaging shall be divided too.

Packaging waste collected through the new separate collection systems organized by the municipalities and/or PRO will be taken into account for the achievement of recycling targets for household packaging. The packaging waste collected by the private waste management companies will be counted as commercial packaging and will not be taken into account for the achievement of targets for household packaging.

Instead of targets applied at entity level, setting minimum targets for the achieved separate collection and recycling rate per capita in areas provided with separate collection services is also possible.

The major difficulties to implement separate targets for household packaging waste are the following:

- It's visually not possible to distinguish between bale of corrugated board with household origin and the same with commercial origin.
- The operators of sorting plants can easily buy commercial packaging waste and report it as household packaging.
- The household packaging shall be reported separately from commercial packaging. This will require a clear definition for each type of packaging and material (e.g thresholds for the plastic containers size, cardboard box size, surface area of the foils, etc.).
- What size of the target to apply for the household packaging?
- How to consider the quantities of packaging waste collected by informal sector.
- How to count the recyclables separated out of residual waste in municipal sorting facilities (or MBT plants in the future).

Objectives for separate collection systems implemented by PROs

The establishment of specific objectives towards separate collection systems, in addition to the existing recycling and recovery targets, can provide clear indicators for the results that have to be achieved by the EPR system.

As an example, such objectives can include:

- Minimum number of residents provided with separate collection services as a percentage of total number of residents.
- Container type and minimum container volume provided per capita served or maximum number of residents served by one set of separate collection containers.
- Collection frequency (or volume collected per capita).
- Obligatory door-to-door separate collection systems implemented in all areas where individual bins are used for collection of residual waste.
- All separately collected waste to be delivered to a specialized sorting facility.

The objectives shall be based on clear technical requirements for the separate collection and sorting systems.

The distribution of total number of residents served between several PROs can be done proportionally to their market share.

7.3.2 Re-usable packaging

The re-usable packaging shall be taken into account when calculating the quantities of packaging put on the market and for the achievement of recycling and recovery targets.

The quantities of the re-usable packaging shall be reported separately by the obliged companies.

These issues are already addressed in the legislation adopted in RS but changes are still needed in FBiH.

The legislation developed at entity level can consider the implementation of differentiated fees for the re-usable packaging.

7.3.3 WEEE

The general principle of the functioning of EPR system for WEEE is summarized on the following figure.

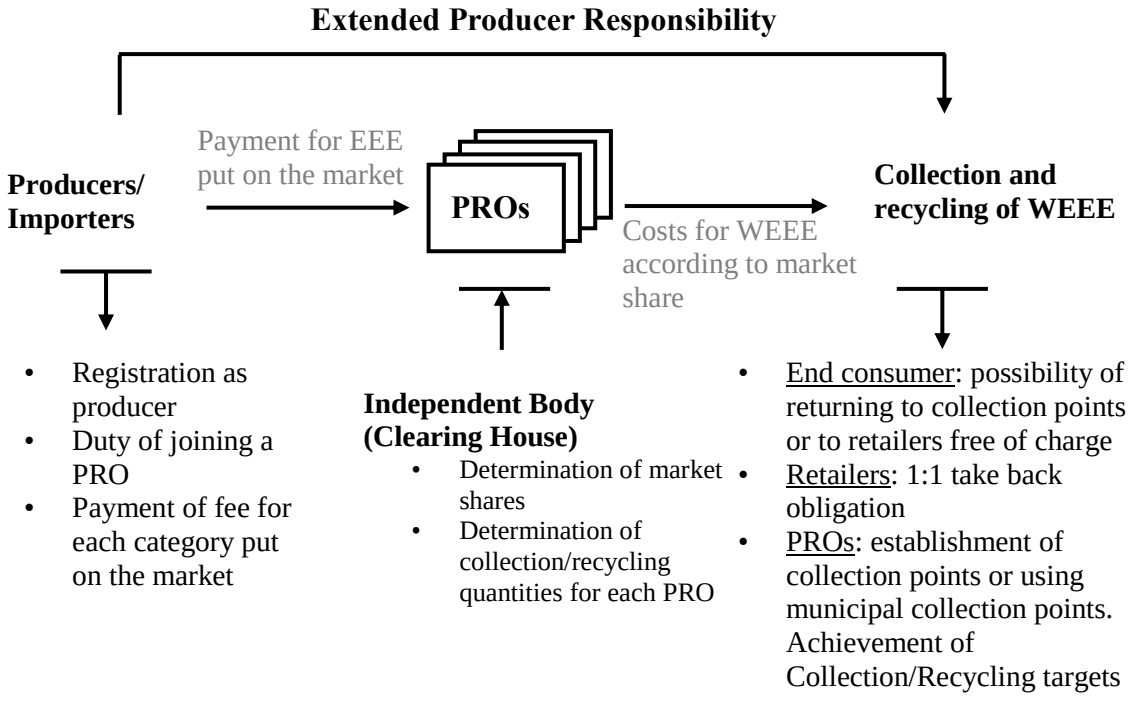

Figure 7-2: EPR system for WEEE

The implementation of extended producer responsibility systems for WEEE in EU countries was analysed in the study on *The Producer Responsibility Principle of the WEEE Directive*[37]. Despite that the study was completed in 2007 it is particularly relevant for BiH as it considers the functioning of ERP systems in the initial period of their operations.

The allocation of responsibility for collection of WEEE from private households is different in the different European countries.

Regarding physical responsibility, the WEEE Directive does not explicitly identify who should be responsible for setting up the necessary infrastructure. It puts the onus on distributors to accept WEEE from consumers on a one-to-one basis when selling new products, although Member State can deviate from this requirement if they can show that an alternative procedure is just as convenient for consumers.

Concerning financial responsibility, the Directive indicates that producers are financially responsible for "at least" the collection from collection points onwards, leaving a room for extending the producer responsibility to finance collection from households.

Table 7-3: Allocation of Responsibility for Collection of WEEE from private households in National Legal Text: EU 27

Member State	Physical Responsibility	Financial Responsibility
Austria	D/M/P	D/P
Belgium (Brussels)	D/M	D
Bulgaria	P	P
Cyprus	P	P
Czech R.	D/P	D/P
Denmark	M	M
Estonia	D/P	D/P
Finland	D1/P	P
France	D/M/P	D/P
Germany	M	M
Greece	P	P
Hungary	P	P
Ireland	D/M	D//P
Italy	D/M	D/M
Latvia	P	P
Lithuania2	D/M/P	P
Luxembourg	D/M	D/M
Malta	D/P	D/P
Netherlands	D/M	D/M
Poland	D	D
Portugal	D/M/P	D/P
Romania	M	M
Slovakia	D/P	D/P
Slovenia	D/M	D/M
Spain	D/M	P
Sweden	P	P

[37] DG ENV. Study Contract N° 07010401/2006/449269/MAR/G4, Ökopol GmbH Institute for Environmental Strategies, Germany, The International Institute for Industrial Environmental Economics, Lund University Sweden, Risk & Policy Analysts, United Kingdom

UK	D/P	D/P

D = Distributor, M = Municipality, P = Producer (definition varies between national and European approach)
Source: The Producer Responsibility Principle of the WEEE Directive, Final Report, Ökopol

An implication of the involvement of municipalities in the collection of WEEE from households is that it may create a disturbance to a level playing field for producers that choose to set up their own compliance schemes. This is because they may not have access to collection sites that is potentially subsidised by municipalities. Industry has argued that collection costs have little or no connection to eco-design incentive and therefore producers should never be given the obligation to finance such activities. However, when considering the polluter pays principle, it may not be appropriate that general tax payers, rather than consumers of EEE, finance the collection of WEEE from private households.

The practical implementation of the WEEE Directive varies considerably between Member States, mainly on the roles and responsibilities for collection of WEEE from private households, the financial mechanism applied and the level of competition between compliance systems set up by producers to fulfil their producer responsibility obligations.

The compliance approaches for WEEE from private households in Member States can be categorised into two – single national compliance systems and competing collective systems. As the names imply, the categorisation is based on whether two or more compliance schemes handle WEEE in the same category in competition (competing collective system), or not (single national compliance system).

Single National Compliance systems have been the standard approach for countries with legislation prior to the implementation of the WEEE Directive.

These counties include Belgium, the Netherlands and Sweden, as well as Norway and Switzerland, which are not Member States. They have developed and continue to have in place national compliance systems, initiated by producers or their trade associations collectively, to practically arrange the take back and recycling operations on behalf of members. Although there may be competitive tendering for services such as transportation, pre-treatment and recycling, in terms of options for producer compliance, these systems are the only collective compliance option available.

Even when there is more than one scheme in operation in the country (ICT Milieu and NVMP in the Netherlands) there is usually no competition between product categories for the management of WEEE. With the national approach to the organisation of producer responsibilities, there is neither a need for a clearinghouse function to allocate collection sites nor market share for historical WEEE. This is because the national scheme is responsible for setting up a national-wide collection system, in collaboration with municipal collection sites and retailers and there is no need to divide this obligation with other collective compliance schemes.

In the majority of EU countries operate competing Collective Systems (PROs)

Both driven by certain national government's opposition to monopolistic arrangements of national compliance schemes, and producer's concern over the price impact of lack of competition, there is an emerging trend towards the establishment of multiple collective systems in competition. From industry side, this process has been spearheaded by the European Recycling Platform (ERP) founding members, Braun/Gillette, Sony, Electrolux and HP. These producers were generally unsatisfied with the functioning of monopolistic compliance schemes for WEEE management in Member States where there is a single national compliance scheme and the tendency to accrue large sums of operating reserve to treat future WEEE.

Proponents of the competitive approach to compliance systems have identified supply chain management as the basis to this model and indicate that single national approaches run contrary to this management strategy. This is because in large organisations supply chains are managed on the basis of competitive tender and WEEE in their view is simply regarded as part of the supply chain activities that

could benefit from identical management skills as those used in other areas of product life cycle management.

In order to facilitate competition between schemes certain involvement of the authorities or a central coordinator is required to ensure that the competitive playing field is level for all market actors on key issues such as access to WEEE and market share allocation of responsibilities for historic WEEE. A clearing house, as it is often referred to, is the most common body responsible for allocating, in essence, producers responsibilities in a fair and accurate way.

Given this, one way of further classifying competing collective schemes is by the mechanism used for the allocation of waste to individual producers or their competing collective organisations managing their responsibilities. It also relates to the level of intervention to ensure access to WEEE is fairly distributed among the producers on the market.

On one end of the spectrum, the use of an algorithm to determine when and where a producer is required to pick up and process WEEE from collection sites. Since producers are responsible for the costs to manage historical WEEE collectively based on, for example, his/her weight-based market share, the total amount of collected WEEE needs to be known so it can be divided among obligated parties. In addition, the location of collection sites in relation to urban centres and recycling facilities is an obvious factor to that influences costs to manage WEEE. In remote locations and sparsely populated areas cost can be significantly higher.

The algorithm attempts to distribute these cost differences among producers for a more equitable outcome. This ensures that all locations are serviced by producers and that all collected WEEE by municipalities is financed by producers.

In theory, this could be considered the most equitable way of assigning responsibility for the management of WEEE collected at collection points. For this allocation mechanism to function there is a need for a strong coordinating body that has the trust both of the producers and municipalities. This approach is used in, for instance, Germany.

On the other end of the spectrum is the situation where government authorities or coordinating bodies have a more or less hands off approach to organising the allocation of responsibility for access to WEEE. Instead of having the starting point of dividing responsibilities based on what is actually collected at municipal sites, the coordinating body assigns a required amount of WEEE to be collected, and leaves it up to producers or their compliance scheme to achieve the results. This provides a so called ‘bounty on WEEE’ that encourages compliance schemes to meet their collection quotas in the least expensive way. There is usually very little municipal collection infrastructure already in place, and compliance schemes will contract directly with retailers for collection of WEEE or may organise special WEEE collection days or even curb side collection.

Under this approach, there is a need for authorities to set the required collection amount to adequately reflect the availability of WEEE in the Member State as well as the desired level of collection rate ambition. Most of the countries employing this approach most often mandate that if producers to not meet their collection targets, any shortages would need to be made up through payment of product fees or payment into a recycling fund. Variations of this scenario are found in Hungary, Lithuania, Latvia, Bulgaria, Poland, Slovenia and Slovakia.

In between these ends of the spectrum there are approaches used where varying degrees of coordination exist to allocate access to WEEE. For example, in Ireland, the national authorities and the 2 competing compliance schemes came to an agreement on how to divide the obligations to collect WEEE from municipal collection sites. In an original agreement the collection sites were divided up based on a geographical allocation of existing sites. This allocation of collection sites represented an equal population served with a representative selection of urban and rural population densities as well as similar average distances to recycling centres.

In Austria the four competing collective schemes are free to contract directly with municipalities to collect WEEE from their municipal collection sites. However, any WEEE collected by un-serviced municipalities not under contract with a compliance scheme, is allocated to the scheme with the highest outstanding obligation of its market share calculation.

In the UK there will be a similar set-up where compliance schemes or waste collection companies operating on their behalf will negotiate directly with municipalities that have agreed to become designated collection facilities (DCF).

Approved compliance schemes are also free to establish their own private DCFs.

In Italy a new coordination body run by industry has been established to ensure the rationalisation and equity of allocation of collection of WEEE from municipal collection sites by the competing collective systems.

In Portugal and Spain, two competing systems are establishing their own collection networks based on both distributors and municipal collection points. In the absence of a coordinating body overseeing the allocation of collection points, each collective scheme in Finland contracts with municipalities directly, and allocation of collection occurs on a rotating basis, where municipal collection sites inform collective systems of their obligation on an ad hoc basis.

As the WEEE Directive stipulates individual financial responsibility for new WEEE, producers are required to finance the costs of waste management of their own products. Although producers can choose to fulfil their obligations collectively, they are not forced to finance the cost of other producer's WEEE.

Since it cannot be assumed that all producers that are on the market today will remain active on the market when their products are collected as WEEE, a financial guarantee is required so that these costs will not fall on society or other producers.

Most Member States interpret membership in a collective compliance scheme to be an appropriate guarantee for new WEEE obligations. At the same time, producers that wish to comply individually must either have a blocked bank account or recycling insurance to satisfy the guarantee requirement. In Germany and Italy and possibly Sweden a financial guarantee is required by all compliers. However in Germany the guarantee can be based on a collective guarantee, which means that producers will be responsible for other producers' products in the event that one member exits the market.

While collection targets and recycling targets are key aspects of EPR program design, different possibilities exist to implement individual financial responsibility within collectively organised systems. Four organizational system alternatives are used as examples to discuss how different organizational structure may also impact the operational complexities.

Individual financial responsibility can be implemented in EPR programs that are organised in varying ways. Under different financial models it is possible to achieve individual financial responsibility both within collectively organized compliance systems and schemes operated by individual producers.

System Design 1: This system design is characterized as having a single compliance organisation or Producer Responsibility Organisation (PRO) that manages the take back and recycling obligations of producers. All active producers are members in the scheme and all collection and recycling infrastructure is coordinated by the scheme. In this case no individual producer collection are recognized towards meeting compliance obligations.

System Design 2: Similar to System Design 1, this system design is characterized as having a single compliance organisation or Producer Responsibility Organisation (PRO) that manages the take back

and recycling obligations of producers. Individual producer collection efforts (own-brand or mixed brand) are counted towards its general obligations under the PRO.

System Design 3: Multiple compliance schemes or PROs operating on a national market (no individual producer collection efforts (own-brand or mixed brand) can be used towards meeting compliance obligations). Producers or their compliance schemes develop collection infrastructure by either contracting directly with municipal collection sites and/or retailers. Allocation of this infrastructure may be done in several ways. This could include allocation of regional areas to compliance schemes, or through the use of an algorithm based formula to assign collection of WEEE from designated collection sites.

Managing the allocation process could be the role of a national clearing house or negotiated between the existing compliance systems or negotiated with national authorities, or a combination of the above.

System Design 4: Multiple compliance schemes or PROs operating on a national market and individual producer collection efforts (own-brand or mixed brand) are recognized and are running in parallel.

The five financial models applied show examples of structuring the financial mechanism used to allocate costs to producers for the management of WEEE. Each model premise is described with its potential impact on new product design incentive. Also presented are the operational requirements needed with respect to new and historical WEEE.

Table 7-4: Combination of systems and financing model: possibility of creating design incentives and complexity

		System 1 Single PRO	System 2 - Single PRO & Individual systems (own-brand or mixed in parallel)	System 3 Multiple PRO	System 4 Multiple Pro & Individual systems (own-brand or mixed in parallel)
Financing Model A: PAYG (historical and new) Current waste management costs within a product category or treatment category are divided among producers proportionate to their market-share (by weight placed on the market)	Design incentives	low	low	low	low
	Coordination between systems	no	low	medium	medium
	Required distinction within product groups	none	none	none	none
Financing Model B1: Return- share (historical and new); Current waste management costs of producers divided among producers proportionate to the weight or number of their own-branded products returned	Design incentives	medium	medium	medium	Medium
	Coordination between systems	no	low	medium	medium
	Required distinction within product groups	brand	brand	brand	brand

Financing Model B2: Return- share (historical and new); Current waste management costs of producers divided among producers proportionate to the weight or number of their own-branded products returned. For both new and historic WEEE costs are differentiated based weight returned and for new WEEE on inherent properties of returned products.	Design incentives	high	high	high	high
	Coordination between systems	no	low	medium	medium
	Required distinction within product groups	-brand - properties - historic & new	-brand -properties - historic & new	-brand - properties - historic & new	-brand -properties - historic & new
Financing Model C1: (PAYG: historical, Return-share (new)	Design incentives	medium	medium	medium	medium
	Coordination between systems	no	low	medium	medium
	Required distinction within product groups	-Brand - historic & new	-Brand - historic & new	brand historic & new	brand historic & new
Financing Model C2: PAYG (historical, Return-share new)	Design incen- tives	high	high	high	high
	Coordination between systems	no	low	high	high
	Required distinction within product groups	-brand - properties - historic & new	-brand -properties - historic & new	-brand - properties - historic & new	-brand - properties - historic & new

The alternatives are, in light of on-going efforts of producers, highly feasible.

In terms of providing incentives for design change Financing Model B2 and C2 has the potential to provide the greatest incentives for producers to redesign products for improved end-of-life management. At the same time it is the most complex to operate.

Given that sorting or sampling of WEEE is required to determine the relative share of new and historic WEEE, it would be less complex to implement in Systems 1 or 2. Since there is only one PRO that is in operation in these models, WEEE collection is handled by one system.

Therefore all sorting or sampling at collection sites to determine brand-share of new WEEE is less complex to manage.

In Systems 3 and 4, WEEE sorting and/or sampling must be done for each PRO since mixed brands are collected at collection sites operated by the numerous PRO's. Information sharing between the systems would be necessary to determine the return-share of each producer's new WEEE. This is more

administratively complex. Alternatively a national clearing house could take a representative sample of the entire country and assign return-share proxies to each producer.

Each system would be responsible for managing the WEEE of its total membership.

WEEE Directive provides requirements about the producer registers and reporting. It requires to MS to draw up national registers and to collect information on the amount of EEE put on the market as well as collected, reused, recycled and recovered within the Member State including exports.

Reporting of products put on the market varies from monthly, quarterly biannually to annual reporting periods. Reporting should be frequent enough to deter unscrupulous producers that, for example, may be able to avoid reporting if only present on the market for peak sales periods. Chosen reporting periods may also affect producers in divergent ways due to certain seasonal variations in sales for certain products which might affect when products are most often returned as WEEE.

Due to the diversity of reporting formats industry has complained about the increased administrative burden placed on them to report data to national registers. When reporting the number of products placed on the market, national registers require divergent reporting with respect to the categories of equipment that sales must be reported in. This causes increased administrative burden and cost, at least when initially setting up internal systems to deal varying reporting formats.

7.3.4 Territorial coverage

Another questions that needs an answer is whether the separate collection shall be organized on the entire national territory or focused only to these areas where efficient collection process can be organized. Considering that the collection of municipal waste is not well developed in the rural areas it shall not be expected that the separate collection can go further.

The following possibilities shall be considered:

- Organizing separate collection in all areas where collection of residual waste is organized. In long term, the separate collection will cover the whole territory of FBiH, RS and BD.
- Setting objectives for minimum number of residents served as percentage of total number of residents.
- Setting a threshold limit for the minimum number of residents living in settlement above which the separate waste collection services shall be obligatory. For example, the system can be organized in all settlements with population exceeding 3000 residents and in all settlements with population between 1000 and 3000 residents located within 15 kilometres from a settlement with population above 10000 residents where separate collection is already established.

In the initial years, the separate collection of packaging waste shall focus mainly on large settlements and gradually extend to rural areas.

Another very important question is whether all PROs shall organize the separate collection services at entity level or the territory where services shall be established will be divided between the PROs. This issue is more relevant for the FBiH where two operators are licensed at the moment but similar situation could appear in RS in the future.

If individual PRO shall provide service on the entire territory of FBiH that will mean each municipality implementing separate collection to have several contracts will all PROs posing permits issued by competent Ministry. In case that obliged industry has the full responsibility to organize the system, all PROs will have to establish their own collection and sorting infrastructure. That means separate collection containers of the different PROs to be installed for the same material in each municipality. This cannot happen practically and the industry will have two possibilities:

- To have only one PRO per waste stream operating at entity level. The permit of the second or smaller PRO shall be withdrawn or the two PROs presently operating on market shall merge their activities.
- The obliged industry will have to establish a clearing house or other equivalent structure dividing responsibilities between the different PROs. This is not a realistic scenario because has to be agreed with the authorities, will require tendering of separate collection and sorting services and supposes financial transfers between the PROs.

The full coverage of the entity territory by the system is possible to be implemented based on shared responsibility between the obliged industry and local authorities. In this case, again a clearing house need to be established in order to divide the payments between the PROs and channel the funds to the municipalities implementing separate collection. The development of such system for a small market like FBiH or RS is very disputable because of the high administrative costs for the functioning of clearing house and the expected implementation difficulties. Considering that all PROs will have same costs per tonne of household packaging collected and practically no competitive advantages with regard to collection system, the existence of several operators is not justified.

In case that service areas are divided between two or more PROs, there will be a competition among them for signing contracts with larger municipalities where the generation rates of recyclable waste are higher and the collection and sorting of waste is more economically viable.

Legislation on EPR for municipal waste streams should avoid cherry picking between collection areas and ensure the same quality and accessibility of collection service nationwide, with a homogeneous, coherent system in terms of image and communication, organised at the local and/ or regional level.

Establishing a criteria for the minimum number of residents to be served by an individual PRO (10 – 20% of the total number of residents served) can be a barrier for the appearance of new competitive schemes.

7.4 Waste ownership

The issue who owns the waste collected and sorted shall be considered in case that PRO will have the full responsibility to organize the system.

Presently the PRO does not own the waste collected by the private operators or municipalities/PUCs. The private waste collection companies deliver waste to the recycling plants on behalf of the PRO but at their own expense.

Alternatively, all waste collected and sorted for recycling that is counted for the achievement of recycling and recovery targets on behalf of the EPR system could be owned by the PRO.

The waste ownership alternatives with regard to household and industrial/commercial packaging waste are presented in the following tables.

Table 7-5: Household packaging waste ownership

Policy	**PRO owns the material delivered for recycling**	**PRO do not own the material delivered for recycling**
Description	The PRO owns the packaging waste discarded into the separate collection containers and the sorted materials.	The waste is owned by the municipality or the operator of separate collection and sorting services

Policy	PRO owns the material delivered for recycling	PRO do not own the material delivered for recycling
Contract between PRO and recycling plant	Required	Required/Not obligatory
Documentary evidences for recycling	Delivery notes and invoices for waste delivered to recycling plants Recycling certificate issued by the recycling plant can be required	Delivery notes Recycling certificate issued by the recycling plant can be required
Revenues for PRO from the sale of recyclables	Price of material.	None. All revenues from the sales of recyclables are going to the municipality or collection/sorting companies (PUC or private contractor)
Other considerations	The PRO decides about the final destination of sorted material (recycling plant)	The operator of sorting plant/municipality decides about the final destination of material. The destination shall be consulted with PRO in case that contract with recycling plant is required
Market risk (change of recyclable waste prices)	PRO	Municipality/Operator (can be shared with PRO based on contract conditions)
Advantages	Clear evidences for recycling of waste submitted by PRO (invoice) PRO controls the entire process Bigger quantities allow achievement of higher revenues from recyclables	More simple documentation requirements from the PRO point of view Cost sharing between several PROs is more easy
Disadvantages	Recycling plants can be resistant to work with PRO Additional financial/market risks for PRO	Some of the municipalities/PUCs deliver small quantities than makes difficult direct supplies to recycling plant or organizing export. Sales to intermediate waste dealers will be necessary

Considering the above if PRO has full organizational responsibility for the separate collection and sorting system, the sorted material is better to be owned by the PRO.

Table 7-6: Commercial and industrial packaging waste ownership

Policy	PRO owns the material delivered for recycling	PRO do not own the material delivered for recycling
Description	The PROs are formally buying the commercial waste from waste collection companies and then selling them to the recycling plants	The companies collecting recyclable waste are directly selling them to recycling plants on behalf of PRO
Contract between PRO and recycling plant	Required	Required/Not obligatory

Policy	PRO owns the material delivered for recycling	PRO do not own the material delivered for recycling
Documentary evidences for recycling	Delivery notes and invoices for waste delivered to recycling plants Recycling certificate issued by the recycling plant can be required	Delivery notes Recycling certificate issued by the recycling plant can be required
Revenues for PRO from the sale of recyclables	Price of material. There is a possibility PRO and waste collection company to agree about fixed price and rules how the additional revenue presented as deviation from the fixed price is distributed (can be positive or negative). In this way the risks for the change in recyclable waste prices is shared between the PRO and collection company	None. All revenues from the sales of recyclables are going to the collection/sorting companies
Costs for PRO	Price of material Additional service fee charged by collection company or waste dealer to PRO	Additional service fee charged by collection company or waste dealer to PRO
Other considerations	Deliveries are possible only to recycling plants contracted by PRO	Existing practice
Advantages	Clear evidence for the recycling (invoice) Possibilities to organize easily the collection of commercial/industrial packaging from PRO clients	More simple documentation requirements No additional money transfers – the recycling plant is paying directly to supplier (collection company/ sorting plant)
Disadvantages	PRO can influence the market of recyclable waste commodities Additional money transfers Possible resistance from waste dealers/collection companies Competition with waste dealers for the access to material Limited experience of PRO to trade with recyclable waste	PRO has limited influence on the choice of final destination PRO is more dependent on the good will of waste dealers

The implementation of both alternatives is possible and the final decision can be left to the operative management of the respective PRO.

7.5 Competitive or monopoly market

7.5.1 General overview

Most EU countries did not grant exclusive or special rights to companies operating collective systems. Their laws do not prohibit the creation of alternative systems.

In most Member States one cross-material system predominates (e.g., ARA in Austria, Eco Emballages in France, Fost Plus in Belgium, EKOKOM in Czech Republic, Valpak in the UK) or one material-specific system predominates per material (e.g., Svensk GlasAtervinning for glass in Sweden). Competitors usually only operate at the market fringes, either by offering individual solutions for specific sectors or by offering systems for specific sectors or materials (e.g., Ökobox and EVA in

Austria). In most of the Member States alternative cross-sectoral and cross-material systems exist but their market shares are appreciably lower than those of the respective ”leading” systems.

The legislation in FBiH do not impose limitations on the number of PRO organizations operating on market. Presently two operators received permits to deal with packaging waste and two for WEEE.

The legislation in RS is more restrictive considering the requirement about the minimum quantities of packaging represented by the PRO. The existence of several PROs is still allowed.

In a case of multiple competing PRO's acting both on industrial/commercial and household flow, among which the companies are free to choose in order to fulfil their obligations, creating a fair playing field is a must.

The following major problems shall be addressed:

- Producers choose the lowest offer on the market having no possibilities to compare and analyse the PRO's activity and taking advantage on their position on the supply chain.
- Waste management companies acting in industrial/commercial stream increase some of their cost taking advantage of changes in demand: Multiple PRO's running for IC packaging (cheapest solution)
- Avoiding household collection specific costs in order to keep their clients PRO's generate underfunding situations on the supply chain with dramatic consequences on long term

The existence of more than one PROs presumes the establishment of clear rules and procedures for fair distribution of tasks between the market participants. The achievement of recycling and recovery targets cannot be the only criteria for the functioning of PRO.

Two main approaches are possible:

i. To set up a special entity (clearing house) with the purpose to distribute and verify the implementation of tasks by the different operators, including the allocation of financial responsibilities
ii. The entity legislation to precisely define the procedures for distribution of responsibilities between PROs. Usually this is based on dividing service territory proportionally to the market share of PROs

The division of responsibilities between the several PROs is usually based on their market share. The market share is measured based on quantity of packaging licensed by the PRO and not based on revenue.

The market share of PRO is changing over time. The market share is always measured for a previous period and not always represent the actual situation on market.

The other issue is that the market share shall take into account the different packaging or electrical equipment categories.

The determination of market shares can be based on data for the previous year according to the annual reports submitted by the PROs. Alternatively it can be calculated every quarter but for that purpose special reporting requirements shall be established.

Table 7-7: Comparison of monopoly versus competitive market

Policy	Monopoly	Competitive market
Advantages	Single point of contact on behalf of industry No need of special mechanisms and procedures to regulate the responsibilities of multiple PROs (eg clearing house) Long term planning is more easy	The competition usually leads to lower prices
Disadvantages	Higher prices	More difficult to administer Lack of clear rules leads to cherry picking
Other implementation issues	The PRO shall represent the obliged industrial branches and	Distribution of tasks and responsibilities between the different competitive schemes shall be solved. Establishment of clearing house

Considering that the markets in FBiH and RS are small the operation of several PROs is not justified. The existence of several competing recovery organizations in a small territory creates difficulties for the development of the EPR system, because of the following reasons:

- Achievement of common agreement about the development of separate collection is practically impossible;
- The different separate collection systems applied does not allow the implementation of a common communication policy;
- The national/entity authorities and municipalities do not have a single partner with whom to negotiate and plan the national policy in the field;
- The system administration costs are high;
- The possibilities for economies of scale at the implementation of separate collection and recycling systems are limited;
- The competition between the recovery organizations requires significant resources to be spent for attracting of new clients;
- the PROs have very limited resources to invest in separate collection systems.

The existing provisions in FBiH and RS legislation about the minimum quantities of packaging represented by the system operators is an appropriate tool to limits the number of compliance schemes. The possible additional measures to limit the number of PRO include:

- Establishment of requirement for provision of bank guarantees or minimum size of the capital of the PRO applying for permit. Such requirement for the minimum size of the capital already exist in the FBiH Regulation on WEEE.
- Establishment of requirement for the minimum number of residents served by PRO.
- Establishment of requirement the PRO to operate at entity level, i.e. to organize separate collection in each settlement in FBiH, respectively in RS.

7.5.2 Ownership of the PRO

The PRO is usually owned by the obliged companies.

Waste management companies and private entrepreneurs could also have interest to set up and utilize their experience on the market, to protect and extend their services (additional revenue stream channelled through PRO).

Considering the significant quantities of commercial packaging generated and collected in the retail sector, some retail chains could be interested to set up their own compliance schemes.

A non-for-profit requirement is another factor that can limit the potential shareholders in the PRO.

The present legislation in FBiH and RS already impose limitations on the possible shareholders (owners) of the PRO. The possible additional requirements towards the ownership of the PRO can include:

- physical persons are not allowed to become shareholders (i.e. only companies are accepted)
- a single company or group of companies cannot own more than certain percentage of shares in PRO (usually between 10% and 30%)

Nevertheless, it shall be noted that restrictions on the ownership and requirements for non-for-profit operation of PRO are difficult for implementation as there are many ways to be avoided.

7.5.3 Clearing house

Clearing House is an independent institution functioning on a competitive market with the purpose of regulating the PRO's activities referring to packaging or WEEE collection from households.

Industrial-commercial flows are regulated by the supply and demand ratio.

The Clearing House must act as

- independent body initiated by the producers themselves (Compliance schemes, industry associations), or
- independent entity from the obliged industry (Chamber of commerce)
- should be subject to strong public surveillance and should also maintain a strict separation of financial interests from any specific PRO's

Alternatively the Clearing house or equivalent structure could be established by the public authorities.

The establishment of Clearing house could have the following objectives:

- To ensure a fair level playing field on the household stream, within a clear and stable framework and with enforcement measures
- To ensure that any new competitor entering the market fulfil all conditions and obligations related with collection of packaging waste and WEEE from household stream
- To ensure that the government body granting new operating licenses has also the ability and obligation to audit (permanently and transparently) the activity of PROs

The Clearing house could play an important role for the financial operations of EPR system through providing a fair determination of the PRO's individual collection, recycling and financial obligations based on market share. This will require a permanent monitoring and balancing of the financial and material flows.

A possible scheme for cost allocation can be based on the following:

- Total collection cost is established by the tenders for collectors held by the systems;
- The auxiliary costs (rent, cleaning containers and/or communication done by municipalities) are shared based on market share.
- All schemes report their volumes under contract per quarter to the Clearing House, where an auditor sums up total volume and assigns a cost share to each PRO;
- This share is to be paid to the collectors who have won the tenders.

The mechanisms for division of responsibilities between several PROs, implemented through the clearing house need to ensure that whole territory, including rural areas is covered with appropriate level of services and to prevent cherry picking strategies.

All financial aspects of the system must be transparent. These include service fees due by the obliged companies, expenditure on collection, transport, sorting and treatment, revenue from sales, expenditure on information and awareness raising campaigns and administration costs.

Identifying financial risks, establishing a contingency fund and finding conflict resolution means and mechanisms for the compliance schemes need to be carefully addressed.

The main functions of clearing house can include:

- Introducing a data collection system, aggregation and verification of data quality and completeness.
- Publishing the total amounts of packaging or EEE put on the market, of waste collected, treated and recycled annually together with a summary of changes in price.
- Ensuring a fair level playing field for all competing PRO's by verifying that all requirements are met.
- Clearing House could be the main contact for municipalities, and can organize the reimbursement for authorities (in case of shared responsibility model).
- Clearing House could support authority in monitoring process (prevent and identify free riders).
- Clearing House could organize the sharing of costs related to communication campaigns organized at entity level through common agreements with local authorities or through common calls for tenders.

The Clearing House as an independent institution must prevent such situations through the following instruments:

- A cost sharing allocation mechanism based on PRO's market share correlated with a clear flows' provenance and PRO's externally audited. Contracting the same auditor to review the documentation and processes of all operating PROs will ensure harmonized definition and procedures for verification and reports.
- The values of costs need to be established transparently and based on performance criteria. In the ideal case all the service contracts shall be awarded based on tendering process;
- Implementation of a high performance financial risk management is required and provision of a contingency fund for any risk can be beneficial.
- In a meantime competent authorities must eliminate legislation ambiguities and align PRO's activities with market forces by implementing proficient and transparent monitoring systems, prevent and eliminate law violations.

7.5.4 Equal treatment of clients

The principle for the equal treatment of clients applies as a rule for the operation of PRO.

Nevertheless, in case of competitive market some PRO are offering individual conditions as tool to attract new clients or protect the existing clients. Such preferred conditions can be lower prices,

discounts from the official prices or additional free of charge services. The special conditions are usually offered to large companies who has significant financial contribution to the system.

In order to avoid discrepancies on the market the legislation shall require for equal treatment of clients.

7.6 Technical aspects

It is wise to implement an appropriate set of pilot projects before launching full scale operations in order to test different collection methods. The existence of individual collectors requires the efficiency of collection systems based on separate collection containers or plastic bags to be initially tested prior to their eventual implementation at national/entity level. The chosen technical solution to implement the separate collection and sorting has direct influence on the amounts and quality of the collected materials and the related costs.

To the extent possible, the new system shall build on the existing recyclables collection/sorting activities, including and involving the informal/semi-formal sector.

The system of separate collection of recyclables includes identification of the type of separate waste collection system. Basically, there are two main forms of collection – door-to-door collection and bring system. With regard to the type of collection system (door-to-door collection or bring system), different types of waste storage equipment can be used. The different collection systems are associated with different quality of the collected recyclables and with different costs.

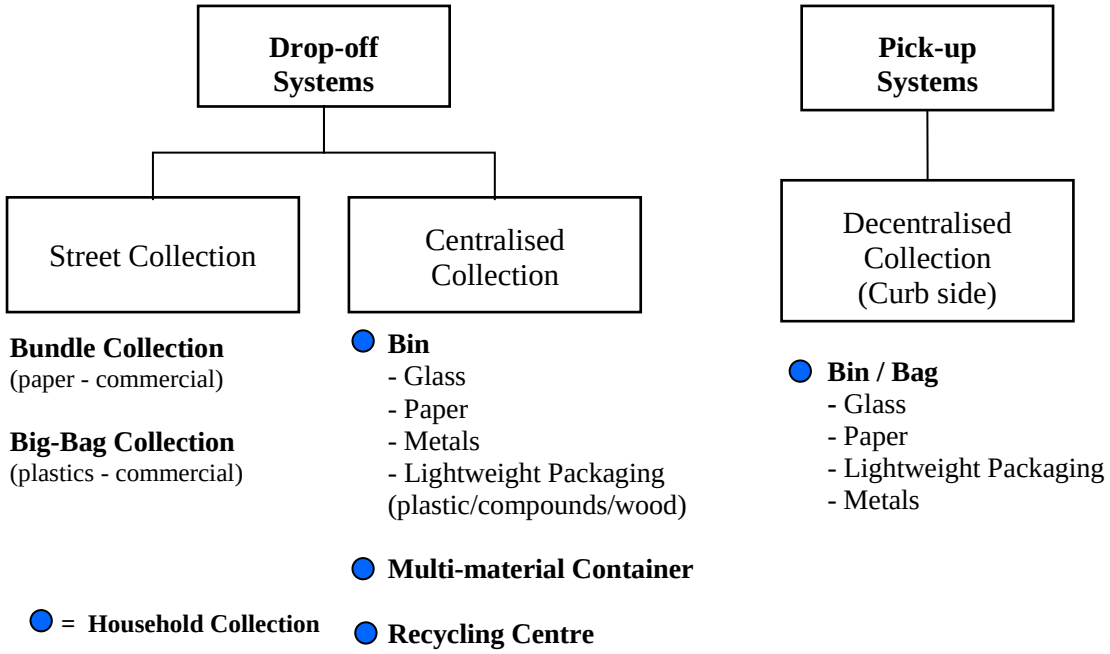

Figure 7-3: Different systems for separate collection

Both types of collection schemes have been successfully implemented in different European cities. The decision whether to implement drop-off or kerb-side collection schemes depends mainly on the collection rates to be achieved but it is also linked with how the residual waste collection is organised, the tariff system in place, people's behaviour, scavengers and many other factors.

The choice of collection system has a significant impact on the costs and the quality of the collected materials.

There are few general rules which shall be taken into account when deciding about the appropriate system:

- The bring systems require more efforts from citizens to reach the containers and discard sorted fractions. It is also very important that in this case the person discarding waste is anonymous and relatively high level of impurities and even residual waste must be expected. In practice that means a lower public participation than at kerb-side systems, lower amounts collected and higher amounts of sorting rejects obtained.
- The kerb-side collection systems achieve higher collection rates compared to the bring systems but they are more expensive. It's also important that the quality of the collected materials is higher in case of kerb-side collection.
- In general kerb-side collection needs to be applied in case that recycling and recovery targets cannot be achieved via the drop-off system or when there is limited time available to convince residents to participate in the separate collection.
- Another very important issue is that once a kerb-side system is established using individual bins or plastic bags, it is extremely difficult to switch to a drop-off system collection and convincing people to walk longer distances to discard their waste.
- The same applies for the number of sorted fractions. Once people get used to sorting plastics, paper and metals together and discarding them into one bin, it is difficult to convince them to start sorting these materials separately and throwing them into separate bins.

Another important decision to be taken is the container types to be used. The size of container has impacts on quantity, composition (quality), volume, weight and unit size of waste collected.

The table below presents analysis of the advantages and disadvantages of the several different options to organize the separate collection of packaging waste.

Table 7-8: Advantages and disadvantages of separate waste collection systems

Collection system		Collected volumes	Content of residues	Costs	Remarks
Door-to-door collec-tion (plastic bags)		Average to high	Low	High	Collection schedule for plastic bags and collection of plastic bags shall be defined. Difficult compatibility with individual collectors and potential problems with stray dogs.
Door-to-door collection (individual bins)		High	Low to average	High	Suitable mainly to areas with individual houses or where container can be designated to a specific building.

Collection system		Collected volumes	Content of residues	Costs	Remarks
Bring system (1.1 m^3 containers with wheels)		Average	Average	Low	Same collection vehicles like for residual waste can be used. The system results can be significantly influenced by type of containers used and awareness campaigns implemented.
Bring system (Igloo type containers for separate collection)		Low	Low	Average	Higher costs compared to 1.1 m^3 containers. Needs specialized collection vehicle with crane.
Bring system (Mesh containers)		Average	Low	Average	Suitable mainly for collection of PET bottles and to a less extend for paper and cardboard. Labor intensive if container shall be emptied manually.
Bring system (buy-back centres)		Low	Low	Low to average	The collected amounts can be higher if material is delivered to recycling centres from individual collectors. Suitable for paper and glass, less suitable for plastics.

The following additional comments can be provided:

- The option with plastic bags is the highest cost option of all as it necessitates a significant investment in purchasing and distributing bags to households. The option can be suitable for areas with difficult access where is difficult to find appropriate sites for placement of containers.
- As noted before, the plastic 120 l waste bins are very suitable for waste collection from individual households, and certainly for separate collection of dry recyclables. However, like with plastic bags, their high overall investment and operational costs make them an inexpedient choice at present too. The system with individual bins can only be implemented in case that the collection of residual waste is organized in a similar way.
- Additional obstacle for implementing a door-to-door collection scheme for recyclables is the difficult access to some of the houses in the central parts of the cities and in the rural areas.

- The main advantage of the bring system with larger containers is the quick loading and the sufficient capacity. This leads to reduction of the operating costs. When located appropriately in the residential areas and in proximity to the main commercial/administrative centres, the collection rates could be increased.
- Buy-back centres are an efficient way of materials recovery as the quality of materials collected is of highest rate. The buy-back centres are convenient in areas with significant informal sector collections. This system however is not suitable for collection in rural areas.
- The implementation of separate collection using standard 1.1 m3 euro containers with wheels will have significant advantages in comparison with other types of containers because of the lower implementation costs and the possible use of the same collection vehicles like these for collection of residual waste.

Establishment of minimum technical standards to be met by the systems for separate collection and sorting of packaging waste will allow better planning of implementation costs by the PROs and municipalities. Such technical standards must be agreed between the PROs, municipalities and the competent ministries. The requirements can be established in the respective regulations for packaging waste, introduced as a separate guidance document or included into the plans submitted by PROs with the permit application.

With regard to collection of WEEE from households agreement shall be achieved about the optimal number of collection points (amenity sites) to be organized by the municipalities and the PRO, the establishment of collection points at the premises of large retail shops and the implementation of « one to one » take back obligation by the retailers to take back a used product upon purchase of a new product of the same type. The role of the scrap dealers in the collection of WEEE shall be clarified. Particular attention shall be given on the avoidance of unauthorized dismantling of WEEE containing hazardous substances.

The availability of recyclable waste markets (don't sort material you can't use), the potential in the waste-stream and the market situation (revenues) shall be considered as main economic factors for taking decisions about the materials to be separately collected and for justification of investments in the collection and sorting infrastructure.

The achievement of recycling and recovery targets in BiH will continue to rely on export markets, especially for glass packaging.

Signing long-term contracts between the PROs and the large paper mills and glass factories is unlikely. These plants have own supply policies, use their standard contracts for supply and keep the power to decide unilaterally about the supply prices and terms. The PROs will have to adopt their activities to the individual policies of the recycling plants.

The possible attempts on behalf of recycling plants to reduce the prices paid to PROs with the argument that part of the fees charged to producers shall go to stimulate recycling shall be avoided.

8 RECOMMENDATIONS

8.1 General

The existing legal requirements provide a good starting point for implementing extended producer responsibility systems in BiH.

The results achieved so far in implementing separate collection and sorting of packaging waste are not satisfactory and the present recycling levels are far below these achieved in other European countries.

FBiH and RS face similar problems and the need of taking corrective measures is well recognized by the competent authorities.

The obliged industries in both entities are obligors to the society and significant additional efforts will be needed to develop appropriate separate collection systems and to establish modern infrastructure for the sorting and treatment of waste.

The waste management issues and in particular the recycling and separate collection shall become a real priority for the local authorities.

Gaining a public support for the implementation of waste separation at source and the participation of significant share of citizens into different recycling initiatives will require more resources to be designated for an extensive communication and awareness programmes.

The dialog between all stakeholders including industry, entity authorities, municipalities and waste management companies will be crucial for the successful implementation of legal requirements. The progress will only be possible if all stakeholders work together for the achievement of common objectives.

As EPR is strongly linked to a public service, transparency is a primary requirement in its implementation. Transparency is necessary to the extent that entity/national governments can control the proper implementation of EPR and both producers and consumers can make informed choices.

Not at the last place significant progress in the management of packaging waste and WEEE will not be possible without achieving general improvement in the municipal waste management practices in the country.

The recommendations presented below are based on the analysis of possible alternatives, provided in the previous chapter, considering that the future development of EPR schemes based on full responsibility of the obliged industries is the optimal solution for FBiH and RS. The recommendations are common for both entities. When necessary and appropriate, the issues that are specific for the entity are explained within the specific topic.

The proposed actions present the opinion of the authors of the present report and in many cases they can differ significantly from the view of the entity authorities or other stakeholders involved. In this regard, **the recommendations shall be considered as a basis for future consultations and stakeholder agreement about the optimal approach to implement the EPR system in BiH**.

8.2 Legal and institutional aspects

8.2.1 Legal requirements, waste management planning and programming

The entity authorities in FBiH and RS is already adopted a set of legal requirements in the field of packaging and packaging waste. Despite of the minor deficiencies, the regulations in both entities adopted a significant step to define the framework for the functioning of the EPR system.

Future amendments in the legal requirements shall focus on:

- Achievement of full transposition of the requirements of EU Directive on packaging waste
- Better definition of the responsibilities of the municipalities and the interrelations with the system operators in the establishment of the necessary separate collection and sorting infrastructure
- Review of the present documentation and reporting requirements
- Review of the recycling and recovery targets for packaging waste

- Optimizing the requirements and the existing procedures for the application, issuing and withdrawal of permits for PRO
- Possible review of the procedures for calculation and payment of fees for packaging placed on the market
- Review of the format and scope of the annual reports submitted by the PROs. Such reporting procedure should define how each activity would be proven (e.g. invoices, delivery notes, weighing sheets, etc).
- Considering the possibility for auditing the annual reports of the PRO and for verification of quantities of packaging declared by the individual companies.
- Establishment of transparent and fair mechanisms for the division of responsibilities between several PROs operating at entity level
- Establishment of appropriate mechanisms to enforce the legal requirements.

The changes in legal requirements shall follow the consultations with stakeholders involved and correspond to the agreed approach for the development of packaging waste management system.

Adoption of new Waste Management Law in FBiH could be considered as one of the possible alternatives to transpose the requirements of EU directives in the field of waste management.

In addition to legislative measures at entity level, there is an urgent need to improve the local regulations that will allow municipalities to better plan for waste management. The regulations will set the tasks and obligations of municipalities, waste generators, including the legal basis for payment and introduction of penalties. Moreover, the regulations can set the conditions for private sector involvement.

With regard to WEEE, the FBiH has adopted an appropriate legislation at entity level. It will be beneficial for the implementation process if following changes are considered:

- Establishment of register of the producers and importers of electrical and electronic appliances
- Review of the WEEE collection targets in line with the provisions of EU directive (4.0 kg per capita per year for household appliances).
- Defining role of local authorities in the development of necessary collection infrastructure for household WEEE.
- Better definition of responsibilities of the retail sector to take back old appliance at the time of sell and/or supply of new appliance
- Establishment of clear mechanism for the division of responsibilities between several system operators.
- Review of the scope and content of the annual reports submitted by the system operators.

The process in RS is at the initial stage and entirely new legal requirements on WEEE need to be introduced. Most likely, amendment of the existing Waste Management Law and adoption of new Regulation on WEEE will be necessary.

In addition to the above, the following actions with regard to the waste management plans and programmes will be necessary:

- The current Federal Waste Management Plan in FBiH will expire in 2017 requiring the development of a new 5-year Plan. The development of the new Plan needs to follow a participatory approach where all relevant cantonal authorities are involved in planning the regional and inter-cantonal waste management solutions.
- A Waste Management plan for RS shall be developed in line with the provisions of legislation and Strategy approved in 2017.

- Missing Cantonal and Municipal Waste Management Plans need to be developed. Guidelines could be developed indicating the contents of such plans.
- Development of specific implementation plans or programmes on the Directive of Packaging and Packaging Waste and the Directive on WEEE can additionally support the implementation process.

Development of new Waste Management Plans at entity level need to follow a participatory approach where all relevant authorities at entity, regional and local level, the representatives of business and professional associations and non-governmental sector are involved.

8.2.2 Strengthening the administrative capacities

The specific responsibilities of the competent entity authorities in charge of packaging waste and WEEE management need to be defined and these to be provided with the necessary capacity to monitor, control and enforce the requirements of packaging regulations. Legislation should provide a clear framework defining the responsibilities of different stakeholders and how the separate collection, sorting and treatment cost will be financed. Special attention shall be given to the role of the local authorities in organizing separate collection in their territories.

Specific issues related to the institutional framework of the sector and recommendations are listed below:

- In FBiH, the FMET, cantonal ministries responsible for waste management and municipalities urgently require strengthening to play their crucial roles in environmental monitoring and enforcement, and information collection, reporting and database management including analysis of information (e.g. in terms of meeting the targets). In line with this a review of their organization and operations has to be carried out, including staffing, tasks, bottlenecks (especially (un)availability of financial resources), shortcomings, etc. and recommendations to improve their performance. It is recommended that a distinct Solid Waste Management section be created in FMET, responsible for planning, preparation of legislation, coordination, supervision and monitoring of waste management on entity and regional level, in close cooperation with FEP of FBiH, cantons and municipalities. Executive tasks of the Ministry could be delegated to an "Environmental Protection Agency" possibly to be created by re-organizing the FEP.
- Similar administrative changes will be required in the RS. Presently the MSPCEE does not have a distinct Solid Waste Management section but is incorporated in the Department for Environmental Protection. It is recommended to create a distinct Solid Waste Management section responsible for preparation of guidelines, planning, coordination, supervision and monitoring of waste management on republic level.
- Based on the experience from other countries at least one person in the respective sectoral ministry shall be in charge with the management of packaging waste. A second person will be required to deal with WEEE in combination with spent batteries and accumulators.
- The municipalities, through their associations, and public utility companies, through the Association of Employers in the Utility Sector, need to be involved in the coordination bodies established for the implementation of regulations on packaging waste and WEEE in FBiH. Establishment of a similar coordination body in the RS could significantly support the implementation process. Such coordination bodies in both entities will provide the necessary platform for stakeholder consultations and will support the achievement of agreement about the division of responsibilities between the system operators and the local authorities. The Associations of Towns and Municipalities and the Associations of Employers in the Utility Sector in both entities shall be constituted as formal partner in consultations with the system operators about the optimal systems for separate collection, sorting and treatment to be implemented in the future. It is necessary to strengthen the capacities of the Entity Associations of Towns and Municipalities and the Associations of Employers in the Utility Sector.

- Development and implementation of a standard contract can be a useful tool to unify the relations between the system operators (PROs) and local authorities.
- The capacities of the Federal Administration for Inspection Issues in FBiH and the Republic of Srpska Inspectorate need to be strengthened in order to provide efficient enforcement of legal requirements and reduce the number of "free riders". A review of their organization and operations, including staffing, tasks, bottlenecks (especially (un)availability of financial resources), shortcomings, etc., is key to inform recommendations for improving their performance.
- A new administrative structure shall be established at entity level to take the functions of a "clearing house" in case that more than one system operator is licensed to operate at entity level. The issue is more relevant for FBiH but same situation can appear in RS in the future. Initially the role of of clearing house can be performed by the Funds or Coordination bodies in both entities.
- Private sector involvement should be promoted in the area of waste collection and the management of specific waste streams under EPR. Various options for involving the private sector, either as operator through sub-contracting or as partner in a PPP have to be investigated in detail, especially concerning the legal and financial aspects. The conditions for cooperation under the various options should be prepared as part of a tender document.
- The administrative (general) component of the fee due by the obliged manufacturers and importers of packed goods and electrical and electronic appliances can be used to finance the additional administrative costs.

8.2.3 Individual or collective compliance for producers

Producers should be able to choose to meet their responsibilities on an individual basis or through a collective compliance mechanism, such as a producer responsibility organisation (PRO).

8.2.4 Documentation and reporting requirements

Companies placing packaged goods on the market should be responsible for the calculation and documentation of packaging amounts. The documentation requirements should be based on the available accounting procedures in order to avoid unreasonable burden on the industry. The documentation shall be kept for auditing by the competent authorities.

The reporting system should be oriented mainly to large producers/importers of packaged goods, and the producer responsibility organizations, in order to guarantee that at least 90% of the packaging placed on the market is reported.

It is essential to put in place appropriate information and reporting systems, incl. reporting templates and procedures, availability of trained staff to process the collected data, developed specialized software, etc. The present reporting templates for the obliged companies placing packed goods on the market in FBiH and RS are already unified to a large extend and only minor revisions will be required.

It is also advisable to review and revise the formats of the annual reports prepared by the system operators. These annual reports shall include information not only about the achievement of recycling and recovery targets for packaging waste and WEEE but also financial and technical data about the development of separate collection and sorting infrastructure, public awareness campaigns, etc. The annual financial statements of PRO shall be public and provided together with the activities report. The amount of packaging waste, respectively WEEE collected through different collection channels shall be documented and reported separately.

Similar to the practice in EU countries the activities reports of the PRO as well as the financial reports shall be audited and verified by independent auditor prior to their submission to the competent authorities.

In line with the provisions of the Waste Framework Direcive, the companies collecting, processing and recycling waste shall be also obliged to provide information to the authorities about the quantities of separately collected, sorted and recycled packaging waste and for the amounts of WEEE collected and processed. They should also provide the PROs with proofs for the quantities of recycled materials received on their behalf.

8.2.5 Permitting and control of PRO activities

The existing procedures for the permitting of PRO are recommended to be amended. In this situation the system operators (PROs) will have to apply for new permits.

The permit of PRO for packaging waste can be issued based on the following information:

- Preliminary detailed financial estimates for the chosen system for collecting, recycling and recovery of packaging waste and evidence that it is financially secured what concerns the initial investment and operating costs;
- Plan setting out the terms of contracts with municipalities and the minimum number of people to be served by the systems for separate collection of packaging waste, per year;
- Measures to attract those who market packaged goods to join the PRO;
- Plan of the quantities of recovered and/or recycled packaging waste by types of packaging materials;
- Plan to reduce waste from packaging, including optimizing packaging and re-use, and the use of recycled materials in the packaging industry, when this does not contradict the hygiene and health standards;
- Measures to be taken in the event of interruption or reduction of the levels of collected packaging waste and its subsequent recycling and / or recovery;
- Plan for informing and attracting consumers to implement separate collection of packaging waste, including educational programs aimed at kindergartens, schools, etc.;
- Measures for the recovery of packaging waste from households, administrative, social and public buildings, catering, retail and facilities for leisure, recreation and tourism;
- Measures to compensate for any negative impact on the market price of recycled materials.

The legislation adopted at entity level shall not allow licensing of recovery organization only for some types of packaging (household, commercial, industrial) or for separate packaging materials (paper, metals, etc.). All PROs shall have full permit covering all types of packaging and packaging materials.

8.2.6 Control and enforcement mechanisms designated to obliged companies

An effective and efficient legal framework accompanied by adequate regulatory investigation and enforcement activity is a primary prerequisite for successful implementation of EPR. The administration should enforce this legal framework to close loopholes and trace free riders.

The non-declared packaging amounts by the obliged companies in BiH is the most critical issue that limits the revenues in the system and breaks the fair competition practices in the sector. The obliged companies shall be subject to adequate control in order to guarantee that their financial contribution is proportional and the requirements of the legislation are met.

Reducing the number of "free riders" will be of primary importance for the proper functioning of the system and requires immediate actions on behalf of authorities and the system operators.

The proposed actions include:

- Identification of all obliged companies placing packed goods on the market. This can be achieved through an improved communication and cooperation with Custom authorities, visiting shops and collecting information from the labels of different products, exchange of information between the Funds in FBiH and RS.
- Organizing inspections to the obliged companies selected on random principle or based on activity and turnover criteria. The inspections can be implemented by independent auditors contracted by the Funds or by the competent inspection authorities. The costs for such inspections can be financed by the general fee paid by the companies placing packed goods on the market. The necessary funds shall be budgeted as administrative costs for the Fund on annual basis.
- The PROs should have the right and the obligation, on its own, or through its authorized representatives, to perform the necessary checks in order to prove that the clients, participating in the collective scheme, have calculated and paid the exact amount of the remuneration fee, as well as to receive samples of the packaging, which is subject of the contract. The members of EPR system subject to independent audit shall be selected on random principle and include approximately 5% of all contracted companies.

The approach towards manufacturers and importers of electrical and electronic equipment can be based on the registration requirement contained in the EU Directive on WEEE:

- Setting up a register of all companies placing electrical and electronic appliances on the market. The requirements for registration and the corresponding formats need to be defined in the legislation. Funds in FBiH and RS will be responsible to maintain the register.
- Import and sales of electrical and electronic equipment on the territory of BiH by non-registered companies will not be allowed.

The proposed changes in the legislation are also expected to reduce the number of 'free riders', to improve the transparency if the activities of the recovery organizations and to optimize the separate collection and sorting system established.

8.2.7 Competition issues

When choosing a collective compliance mechanism, it is important that it is designed in such way that producers cannot gain an unfair advantage over their competitors or avoid their responsibilities by choosing one or the other of these mechanisms. Moreover, if legislation allows multiple PRO's to compete for the same waste stream, it should be ensured that they operate effectively together and without jeopardising the achievement of policy targets.

The existence of several PROs on small markets like FBiH and RS could cause significant and disproportionate administrative costs, reduce the possibilities to gain benefits from the economy of scales and significantly limit the possibilities for investments in new sorting and treatment infrastructure. The obliged industries in FBiH and RS have the sole responsibility of finding optimal solution for the structuring of their activities. The industry associations like Chambers of Commerce can take more active role in setting up EPR schemes and in the coordination of the implementation process between the obliged companies.

8.2.8 Trade mark issues

The marking of packaging with a specific trademark indicating appurtenance to a specific PRO shall not be obligatory.

The use of any trade mark shall be regulated by the legislation on trademarks and antimonopoly. The competent Ministry in charge with protection of environment shall not interfere in the relations between private companies that are obviously outside its functions and responsibilities. If certain company is considering to be affected by a miss-use of trademark or the holder of a trademark is assuming illegal use of its registered trademark by other entity they are free to address the issue to the competent authority or court.

8.2.9 Prospective Role of the Private Sector

Greater involvement of the private sector is likely to be necessary if the objectives are to be achieved within a realistic timeframe. For this to happen it will be necessary for government to address a number of critical issues to ensure that private firms are able to operate fairly and profitably on the market.

8.3 Financial aspects

Establishment of a producer responsibility scheme to deal with packaging waste assumes that industry will be responsible for financing the separate collection and sorting of packaging waste. Considering the limited financial resources of the municipalities, the recommendation is that the obliged industry, through the PRO to cover the full costs of the system.

8.3.1 Product taxes/fees

The fees/product taxes charged by Funds in FBiH and RS will continue to play a role of a penalty for non-compliant companies.

The existing charging mechanism and calculation formulas have to be reviewed and replaced with new clear rules. The possible charging mechanism can be as follows:

- Product taxes shall be imposed to all packaging materials placed on market
- The tax is proposed to be defined in BAM per kilogram of packaging and shall have different size for the different packaging materials.
- The amount of the tax shall be calculated by multiplying the total quantity of the packaging put on the market during the reporting period with the amount of unit tax for the same material (coefficient). The annual recycling and recovery targets shall not be participate in the calculation formulas.
- The tax is recommended to be payable on monthly basis to the respective Fund. Tax exemption, annual payment or lump sum advanced payment can apply for companies placing small quantities of packaging on the market. Threshold values need to be defined.
- The size of the tax shall be high enough and above the actual costs for separate collection and recycling per tonne of the respective packaging material. This will lead to a significant increase of tax in FBiH and RS for certain packaging materials.
- The companies achieving the recycling and recovery targets individually and the producers and importers of packed goods who sign a contract with a PRO shall be relieved from the obligation to pay product tax to the Fund.
- The re-usable packaging can be exempted from the taxation or declared only once during its life cycle.

It needs to be underlined that the purpose of product tax is to provide an incentive for the obliged companies to join the collective scheme implemented through PRO and not to generate additional revenue in the Fund. In this sense, the product tax shall be considered as a kind of penalty imposed on the obliged companies for non-achievement of recycling and recovery targets for packaging waste.

In case of non-achievement of recycling and recovery targets, the respective PRO shall be obliged to pay a penalty that is equivalent at least to the double size of the product tax for the quantity of the material that was not recycled and/or recovered.

The producers and importers who declared lower quantities of packaging than actually placed on the market could be obliged to pay the product tax in double size for the undeclared packaging.

The existing practice for covering the administrative costs occurring for the competent authorities through a general fee per kilogram of packaging placed on the marked is recommended to continue. The revenues from this fee should be used for the following purposes:

- Covering the administrative costs of the Fund and the Ministry for issuing permit of PRO and for the control of its activity
- Maintain packaging waste quantities database
- Control of obliged companies
- Implementation of common public awareness campaigns

The use of revenues from the general/administrative fee for the purposes of control and/or raising public awareness is optional and could require amendment in legal requirements.

8.3.2 Service tariffs

Setting up tariffs for services should be a sole responsibility of the PRO. The respective PRO is free to decide about the fee structure and applied charging policy.

It shall be recognized by the public authorities that the service fees charged by the PRO are not public funds and any interference in the business activities shall be avoided. In this respect, there should be no limitations on the maximum allowed administrative or other costs for the PROs. The competent authorities shall focus on the actual result achieved and has nothing to do with the funds spent for the specific activities.

Nevertheless, the plan prepared by PRO and submitted for approval from the MEPT as part of the permitting process, shall contain detailed cost estimates and justification that the proposed system is financially sustainable. The tariffs charged by PRO is recommended to be publicly announced and the PRO shall inform the Ministry for any change in the tariffs.

The PRO have to guarantee that same conditions apply for all its members no matter whether they are shareholders of the company or clients. In this regard, agreement of individual prices/discounts shall not be allowed.

A non-for- profit requirement for the activities of PRO is recommendable.

Considering the present levels of tariffs charged by the system operators for packaging in FBiH its obvious that they are significantly below the levels charged by the PROs in other European countries. The implementation of separate collection and sorting system for household packaging waste will not be possible to be achieved without significant increase of tariffs charged by the PROs in FBiH.

The opposite observation can be done for the level of service tariffs in RS.

All PROs are recommended to implement a fair and transparent tariff calculation processes that address the real costs and limit the possible cross material subsidies. The tariffs of the PROs shall be public.

8.3.3 Financing of initial investments

In line with the recommendation for the full organizational responsibility of the PRO for organizing the separate collection and sorting of packaging waste from households, the operator shall guarantee the financing of initial investments.

The initial investments for the purchasing of separate collection containers can be covered directly by PRO, while the collection vehicles and sorting infrastructure can be provided by the companies contracted to perform the respective service. In specific cases the PRO can invest in sorting facilities and transfer the assets to specialized company contracted for the service.

In case that PRO intends to operate the separate collection and sorting by itself it shall register a separate company and obtain the necessary permits.

The separately collected waste and the sorted materials shall be owned by PRO and traded on its behalf.

The PRO shall have contracts with recycling plants.

8.4 Separate collection, sorting, treatment and recycling of waste

8.4.1 Objectives and targets

A fundamental goal of EPR is to increase the collection and recycling of waste. Therefore, ambitious and clear targets need to be set. Also, clear targets or objectives on household waste should avoid cherry picking of easily recyclable materials and products, either at the collection or dismantling phase.

Targets could be qualitative and/or quantitative and could be set for a group of products or for individual product categories.

In line with the analysis in the previous sections the targets for recycling and recovery of packaging waste need to be increased to the levels defined in the EU Directive on packaging and packaging waste[38]. An ambitious but realistic time frame for the achievement of targets have to be agreed and defined in the legislation adopted at entity level. The preliminary estimate is that the higher targets can start to apply as from 2020 and then gradually increase till 2025.

[38] Systems for the return and/or collection of used packaging must be introduced in order to attain the following targets:

- 60 % as a minimum by weight of packaging waste to be recovered or incinerated at waste incineration plants with energy recovery;
- Between 55 and 80 % by weight of packaging waste will be recycled;
- The following recycling targets for materials contained in packaging waste must be attained: 60 % by weight for glass, 60 % by weight for paper and board, 50 % by weight for metals, 22.5 % by weight for plastics and 15 % by weight for wood.

The targets for collection of WEEE with household origin will also need to be increase to the levels prescribed in the EU Directive on WEEE. The targets shall be calculated as percentage of equipment placed on the market.

8.4.2 Development of separate collection system for household packaging waste and WEEE

The competent entity authorities, in consultation with PRO and local authorities shall agree and define the minimum technical standards to be achieved by the separate collection systems for household packaging. For example, such requirements can include:

- The minimum number of residents to be provided with separate collection of packaging waste
- The type of the system
- Minimum volume of containers provided per capita/household
- Minimum collection frequency

Establishment of additional recycling targets for household packaging is not recommended at this stage.

The holders of packaging waste have to be obliged to submit it to the places designated for that purpose and to follow the regulations issued by local authorities for collection of such waste.

The separation at source and recycling is obligatory for commercial and industrial packaging and waste holders. The at source separation and separate waste collection could be made obligatory for all commercial, industrial and administrative objects with an area higher than certain threshold (e.g. area >100 square meters).

The packaging waste quantities separately collected and sorted by the PRO should be reported separately for each municipality and divided between household packaging waste and waste of other origin.

The requirements for the separate collection of WEEE from households shall be defined in a similar way like for the packaging waste.

Technical standards for collection and treatment of different WEEE categories will need to be developed and agreed in order to guarantee the minimal quality of the services. Such technical requirements can include:

- Number of people served by a collection point
- Minimal technical requirements for the public collection points (municipal or private)
- Minimal technical requirements for the collection (take back) points at the premises of retailers
- Requirements and guidelines for mechanical/manual dismantling and depollution

The obligation of the retailers will also need to be defined and can include:

- to inform buyers about the legislation prohibiting the disposal of WEEE with regular household waste, the availability of collection systems, and the potential effects of hazardous substances contained in EEE on the environment and human health
- to take back a used product upon purchase of a new product of the same type (an obligation call « one to one » take back)
- must take back for free, all the small household appliance (applies only for large retailer shops, e.g. with sales area > 200 m^2)

8.4.3 Sorting of separately collected waste

Another important element of the packaging waste management system is to guarantee that all separately collected material is delivered and processed in designated sorting facilities. The PRO have to organize this process through contracts with specialized companies operating the necessary infrastructure. The PUCs can provide sorting services to PRO on competitive basis.

The permits issued by the competent authorities need to guarantee that operation of the sorting facilities is in conformity with the recent technical standards and the applicable health and safety requirements.

Each delivery of unsorted waste to the facility, the sales of the recyclable commodities and disposal of residues shall be recorded and documented in order to provide the necessary evidences for the future auditing of the system.

The disposal of residues to the municipal landfills is recommended to be free of charge for the respective PRO/sorting facility and the related costs to be covered by the municipalities where the waste was separately collected.

8.4.4 Markets for recyclable waste

Markets for recyclable waste should not be viewed as a limitation factor for the achievement of the recovery and recycling targets in the country.

The PROs will continue to rely on export markets for the recycling, recovery and disposal of certain categories of packaging waste and WEEE.

Development of additional recycling capacities in BiH will be entirely based on private initiative. The Environmental Protection Fund in FBiH is presently considering establishment of new financing mechanism based on free of interest loans aiming to support the development of recycling industry.

8.5 Inter-entity issues

According to present institutional set up, the management of packaging waste and WEEE is organized at entity level.

The existence of two independent systems functioning on relatively small national market is not an optimal solution that leads to high administrative costs for the PROs in both FBiH and RS. In Belgium that is a country with a similar administrative division one national scheme for packaging waste is operating at national level.

Setting up a national EPR scheme for packaging waste or WEEE to operate in all entities is not possible and realistic within the existing institutional and legal framework.

Nevertheless, the basic preconditions for implementing a unified approach in both FBiH and RS already exist:

- The waste management laws and regulations for packaging waste adopted in FBiH and RS have many similar elements.
- The competent authorities at entity level and the Environmental Funds have similar structure and functions and there is a good communication between these institutions.
- The existing inter-entity steering committee for the environment could play the administrative role to coordinate the implementation approach.

The possible approach to unify the systems could be:

- One operator to obtain permits to set up packaging waste management systems in both entities, or
- The operators licensed in the different entities to coordinate their activities based on cooperation agreements.

If unified approach applies that will allow the obliged companies (producers and importers) to have a single point of contact no matter of their place of registration or core activities in the country.

All entities shall apply similar reporting templates. This will allow the aggregation of data at national level and will support the exchange of information and the enforcement of legal requirements in all entities. The reporting format for the obliged companies in RS already contains data about the quantities of packaging placed on the market in FBiH and BD. Similar reporting formats can be introduced easily in FBIH.

The other issue that need to be solved is how to organize the management of packaging waste and WEEE in the District of Brcko. As already mentioned, the implementation of separate EPR system in BD will not be an efficient solution due to the small population and territory and respectively the small quantities of packaging waste and WEEE. In this regard, it will be more appropriate if the obliged companies placing packed goods or electrical equipment on the market in BD are allowed sign contracts with the PROs licensed in FBiH and RS. They will have to declare the quantities of packaging or electrical equipment sold in BD and pay the respective service fees to the operator. The operators will transfer the funds collected to BD, retaining small percentage of fees for covering the administrative costs. The entire process shall be agreed in the inter-entity steering committee and can be implemented through cooperation agreements to be signed between the BD and the EPR system operators licensed in FBiH and RS.

8.6 Operational aspects

There is a significant room for improvement of the operations of PRO.

The obliged companies shall recognize that the implementation costs are significant. The expectations that the system could be much cheaper than in other EU countries are not reasonable and realistic. The development of efficient separate collection system and establishment of necessary sorting and treatment infrastructure will require significant increase in the tariffs charged by the operators.

The responsibility to establish efficient system shall be seriously considered by the obliged industry and all necessary efforts shall be done to demonstrate real improvements and practical results.

In the field of packaging waste management very little has been achieved over the last years can give sufficient arguments to the authorities to review the implementation modality and set up Fund managed scheme.

In FBiH, all shareholders of Ekopak and Ecojivot are obliged companies who should have similar views and objectives. In this situation the business arguments for the existence of two operators are not very clear and the two licensed operators shall seriously consider the possibility to merge their activities. In this way the administrative costs will be optimized, the industry will obtain much stronger position in the future consultations with public authorities and most importantly will allow concentration of more efforts and resources on core activities. Having one strong EPR scheme, covering the whole territory of FBiH will allow for better planning of activities, improved cost efficiency and will bring more sustainability in the long-term operations of the system. It shall also be considered that the merge of existing operators can avoid the need of setting up Clearing House or equivalent structure to distribute the responsibilities between several PROs.

The Chamber of Commerce and other business associations can play more active role in the consolidation process and in creating awareness within obliged industries about their responsibilities. The PRO shall consider the possibility for increased representation of all obliged industries. This can include accepting new shareholders and involving more companies in the management of the system.

A permanent and productive dialog with public authorities must be established and all disputes shall be resolved in good will. A common vision and agreed implementation approach is a must.

The other issue that need to be addressed is the on-time reporting and payment of clients that will allow the PRO to better plan its operations and avoid unnecessary risks for delivery of services and the achievement of recycling and recovery targets.

The existing practice the memers of PRO to report on quarterly basis can be a serious issue. The reason is that the report for the fourth quarter will be received in the next year and there is absolutely no guarantee that the recycling targets will be achieved. The quarterly reporting requires the PRO to operate with serious reserves in order to reduce the potential risks. Establishment of contractual obligation for reporting and payment organized on monthly basis is strongly advisable at least for the large companies.

8.7 Communication and public awareness

Requirements for raising public awareness and educating society about the importance of waste recycling shall be established in legislation adopted at the entity level and all plans in the field of packaging waste.

The PROs shall be primary responsible for the implementation and financing of appropriate communication measures. The communication costs shall be taken into account when defining the service tariffs. A communication and public awareness component can also be included in the administrative fee due to the entity Environmental Protection Funds

The target groups, key messages and communication channels need to be defined prior the start of EPR system implementation. Special attention shall be given to work with kids in first school classes.

8.8 Consultations

Identification of all stakeholders potentially affected by the EPR system and setting up consultation process will support the implementation. These usually include the representatives of the business associations in the country, various branch chambers and associations, especially these from the FMCG sector, waste management companies, recycling industry, local (and regional) authorities, NGO. The involvement of representatives of large multinational companies could be of significant support for the discussion process.

8.9 Supportive measures

<u>Use of municipal waste infrastructure</u>

Treatment of waste prior to landfilling is a requirement of the EU Landfill Directive. The treatment of municipal waste can also support the achievement of targets for recycling and recovery of packaging waste. Nevertheless, the implementation of advanced treatment technologies will require significant additional investment and operating expenditures that will considerably influence the size of municipal waste service tariffs.

Any kind of EPR system that uses municipal infrastructure should guarantee a compensation of reasonable costs for the use of this infrastructure. In any case, local and regional authorities should not have any obligation to hand over collected waste falling under EPR if their reasonable costs are not covered by the producers.

Municipal waste tariffs and charging policy

The current user-charging system is based on a simple model in which waste collection companies are responsible for registration of users, calculating tariffs, levying charges on users, user payment arrangements and bad debts. Review of the present charging system and implementation of volume or quantity related tariffs can provide an incentive for households to separate waste at source.

The increased costs for the local authorities due to implementation of recent technical standards towards landfill of waste and the implementation of more advanced treatment options will also indirectly support the development of separate collection systems.

Establishment of disposal fee for landfilling of waste is another long-term option to support waste recycling.