Re-use of waste

- another obligation or powerful opportunity

Prepared by
Institute for Rural Development and Ecology

Tihana Tarandek Galović
Marijan Galović

European Fund for the Balkans
Bringing the Western Balkans closer to the European Union

NEF
NETWORK OF EUROPEAN FOUNDATIONS

Re-use of waste

– another obligation or powerful opportunity

Prepared by:
Institute for Rural Development and Ecology

Gradec, 15th of September 2013

Publisher:

IRRE

Institute for Rural Development and Ecology
Gradečki Pavlovec 35
10345 Gradec, Croatia

Authors:
Tihana Tarandek Galović
Marijan Galović

Graphic design and prepress:
sve5, Zagreb

Contents

Abstract or Executive Summary

When the materials are collected by the municipal waste companies and no matter whether materials are recycled or discarded – they immediately become waste. Waste prevention (including the re-use of materials) is a set of actions whose aims are to prevent materials entering into the waste management system and to encourage the re-use of the materials for the same purpose or to create products which create less waste. The purpose of this paper is to examine the current policy environment in Croatia, compare it with European standards and obligations and create policy recommendations for the Croatian national Waste Prevention Programme.

In 2010, the Republic of Croatia produced, in total, 1,629,915 tons of municipal solid waste, which corresponds to 367 kg/capita. Only 227,651 tons (14%) of this waste was collected separately, but disappointingly, from this amount, only 68,947 tonnes (4%) was directly committed to recovery operators. In contrast with these facts, EU waste legislation states that by 2020, every member state has to reach the 50% mark of waste recycling and prevention and this creates the strongest argumentation for the creation of a Croatian national prevention programme which has to identify and encourage the actions which will, in the future, support waste prevention activities.

EU legislation has already set up the main measures in its core directive which have to be implemented in order to support the prevention of waste. The WFD in article 11 states that Croatia shall take the appropriate measures to promote recycling and the preparation of materials for re-use such as the promotion **of the establishment and support of re-use and repair networks**, **use of economic instruments**, **procurement criteria** and **quantitative targets**. This means that Croatia ***should*** create a set of measures presented and adopted through the national Waste Prevention Programme.

After elaborating the definition and description of the policy problem, this paper has examined and evaluated the main policy alternatives from the European Union which are in line with the measures emphasised in the waste framework directive. The role of re-use and prevention networks is absolutely imperative in the alternative policy scenario as it creates the opportunities for local development (green jobs, local economy, social integration etc.) which is contrary to other environmental solutions which tend to burden tax payers or cost private business owners. However the re-use centres in the EU work under different conditions than the rare re-use initiatives in Croatia described in this paper. The main difference comes from the fact that in the majority of EU states, certain economic instruments already exist while Croatia still depends on cheap or free landfilling operations. The economic instruments presented in this paper include the landfill tax and environmental credits which are major drivers for the success of the waste prevention operations sustainability. Environmental benefits, in combination with local development opportunities, make waste prevention a real solution worth implementing on the local level. However, political support is needed for boosting these activities to become an important economic development tool in Croatia. The current state of awareness of Croatians is rather high and more than 78.7% of the citizens questioned agree that current behavioural pattern will lead our world towards environmental disaster and, at the same time, 87.2% agree that politicians don't do enough to protect the environment

Besides the introduction of measures already described in previous paragraphs, additional elements of waste prevention should be constant like the **interactive education** of citizens on all of the aspects of waste prevention (where and how to shop in environmentally sound

ways, advice for the end destination of each non-usable product etc.). There are several ways to tackle the industry for more rational behaviour and the NWPP should identify and **introduce taxes and/or bans** on certain products which cannot be captured within the scope of the re-use schemes (non rechargeable batteries, non returnable packaging for beverages, multi-material products which cannot be dismantled and recycled etc).

Therefore, the combination of financial instruments, laws, information, incentives, institutions and service delivery will get Croatia on the right track to satisfying the waste hierarchy and create a more sustainable economy.

1. Introduction

Throughout the entire world, there is only one type of species of plant or animal which produces materials which cannot be returned into natural cycles. This would be humans producing mixtures of different types of materials which jointly present waste. These materials, landfilled somewhere outside our cities, cause pollution to the soil, waters and atmospheres and, at the same time, the value of discarded materials is estimated to be 5 billion Kuna only in last 10 years while an additional 2 billion was spent on sanitizing legal and illegal landfills in Croatia (a total of 0.92 billion EUR)[1]. This paper will focus on the first two hierarchy steps for the solution of the waste problem; waste prevention and re-use of waste.

The introductory part of this policy paper focuses on the description of major issues associated with waste in general; ethical issues (waste as result of human behaviour and activities), environmental issues, current state of awareness in Croatia and the problem in its current policy environment for whose purpose we have used empirical methods, the method of content analysis and compared 3 separate statistical studies on waste issues in Croatia.

The same methodology was also used for the second part of the policy paper which presents available policy options for the preparation of the Croatian National Waste Management Programme (NWPP) which has to be prepared, at the very latest, by December 2013. This part of the policy paper examines the policy obligations which have to be translated from EU environmental acquis to national legislation and gives an overview of available options in the form of 5 small case studies regarding the re-use networks, economic instruments, legislation enforcements and summarized benefits of prevention programmes.

The last part of this policy paper presents recommendations and conclusions in the form of the proposed main elements which have to be included in the proposed NWPP in order to be fully supportive towards the re-use networks, create financial incentives for prevention activities, define the procurement criteria and present quantitative targets for the re-use of waste (which are the goals set by the European Waste Framework Directive (98/2009/EC). The conclusions and recommendations will be used for advocacy work during the public discussion period for the NWPP and sent to the Croatian Ministry of Environment and Nature Protection.

The limitation of this study and re-use policy in general is that it mostly focuses on end-of-life product users (citizens) while much more focus should have been given to product designers and producers who are also highly responsible for the current situation.

1 http://www.index.hr/vijesti/clanak/zmajlovic-danasnja-slika-ostavljanja-glomaznog-otpada-na-ulici-otici-ce-u-povijest/685891.aspx

2. Problem description

For the last few decades, the human population has been facing the terrible consequences of its own impact on the environment. Whether it is because of the exploitation of natural resources, damage done by unsustainable human lifestyles or the exponential growth of the human population, there is a great need to find solutions for these complex and complicated issues. ***One of the most significant and most visible types of evidence of human existence in this world is waste.*** Humans create waste in every aspect of their lives by consuming natural resources, whether directly or indirectly (during the process of lumbering, mining, manufacturing, transporting, packaging and after the usage – discarding). As described above, waste in general can be seen across a few principal pathways; a problem for human society and the environment and the ethical issues which arise in every step of a product's lifecycle.

2.1. Ethical dilemma

During last few decades', interest in the environmental crisis has grown beyond technical and natural sciences taking into account a lot of research coming from social sciences and humanities. Today there are scientists, organizations, NGOs, institutes etc. that play a big role in the modern environmental decision making processes when it comes to resolving ecological crises.

They have specific points of view and explore different parts of environmental problems and how they have influence on societies but also ecosystems all around the world. With the help of natural sciences and new modern green technologies, they lobby for better technical and economical solutions which are sustainable not only to humans but also to the natural environment. One such example comes from the field of philosophy and it is connected with human moral behaviour answering the question of how to determine what is good, just and fair in coexistence of humans and the natural world and try to provide solutions on how nature should not be determined just by human needs. This new discipline involves environmental ethics and it can be divided in two sub-disciplines – theoretical environmental ethics and applied environmental ethics. Theoretical environmental ethics concerns itself more with the questioning of human moral behaviour towards other non-human species but also tries to give moral status to non-human species (i.e. animals, plants or even ecosystems) or discuss future generations and our moral obligations to people who aren't born yet. Applied ethics is more focused on concrete environmental problems such as climate change, agriculture, population, natural resources but also pollution. Since waste is the biggest pollutant coming solely from the human world, there is a great need to show how it can be treated with the best possible options that could be called eco and ethical solutions.

One thing that needs to be noticed is that waste is, in general, an ethical problem. It is produced during all stages of product manufacture, to consumption and even when discarded. From exploitation of raw and virgin materials to cheap production (whether discussing the quality of the product or the exploitation of labour workers) to unsustainable consumption connected with modern lifestyles of possessing things towards creating waste as such, that it becomes a huge problem beyond borders. One of most important aspects of how it should be dealt with is in its own genesis – waste should not exist in modern societies. The best way of how it should be dealt with (if even this term is correct) is to prevent waste production and re-use focusing on the principles of a sustainable future.

As Michael J Thompson (2001.) sees it, »waste results when resources (natural and human) are utilized in society in such a way that the maximum number of individuals within the community are unable to benefit from the collective resources and efforts of social activities.« Thompson points out three ethical »dimensions« of waste: socially unproductive activity, under-utilization of resources, and the mis-utilization or mis-direction of resources. Therefore, it is viable that the production of waste depends on answering the question of how to create a more efficient product that will fulfil its purpose in every aspect and serve the most society members in the long-term.[2] Additionally, waste shouldn't be treated as trash but as a new resource that can be re-used.

Bearing that in mind, the following assumptions are developed:

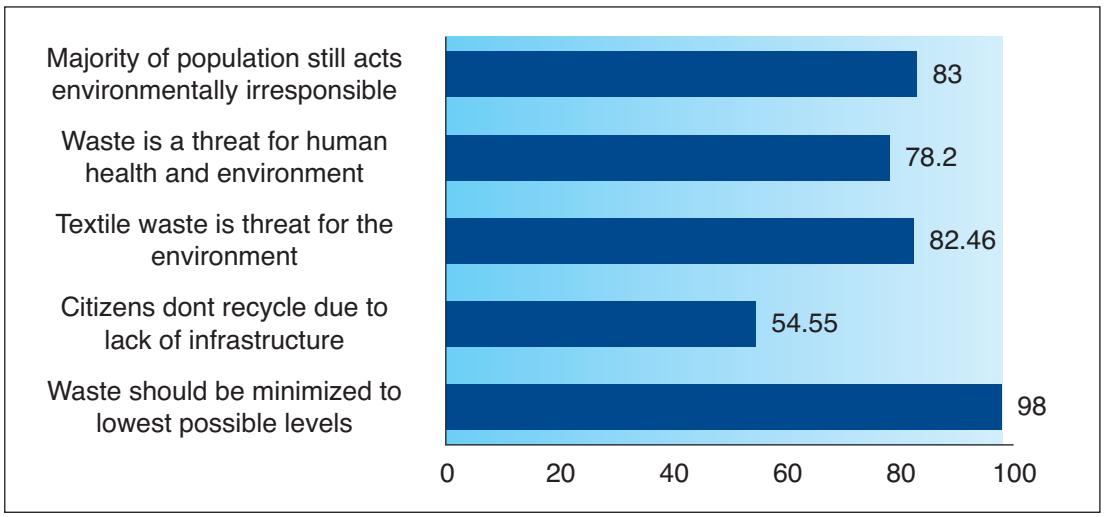
a) When a product doesn't have a purpose to one individual before discarding, it should be questioned whether someone else needs it
b) Products that can be used by a larger number of individuals can be shared instead of purchasing one for each individual
c) Products, which cannot be re-used or recycled due to their design, should be replaced with products of a better design or their usage should be avoided

If these 3 ethical assumptions are placed inside every citizen's mind at the policy level, then the idea of waste prevention would be a natural course of movement in everyday life.

2.2. Current Croatian policy framework

In 2010, the Republic of Croatia produced, in total, 1,629,915 tons of municipal solid waste, which corresponds to 367 kg/capita. Only 227,651 tons (14%) of this waste was collected separately, but disappointingly, from this amount only 68,947 tonnes (4%) was directly committed to recovery operators.[3] If we take into account that approximately 75% of land-filled waste is of organic nature, we can only conclude that 1,170,726 tonnes of CO_2 will additionally be released into the atmosphere as a direct cause of the bad waste management situation in Croatia[4]. This waste additionally produces high amounts of fluids which could seep into the underground waters, releasing highly dangerous toxins if the fire occurs.

2.2.1. Citizens awareness in Croatia



2 Thompson, M. J., Ethical dimensions of Waste, William Patterson University, USA

3 Agencija za zaštitu okoliša, Izvješće o komunalnom otpadu 2011, http://www.azo.hr/lgs.axd?t=16&id=4707 (viewed on 15.08.2013)

4 Conversion ratio is 1 tonne = 750 kg of CO_2

This topic is presented as comparative analyses of 3 recent studies done in Croatia on the topic of waste management. The study called »the socioeconomic analyses of waste management in the Cities of Osijek and Subotica« (2013) has shown that 83% of the population agrees with the claim that majority of the population still acts environmentally irresponsibly. The same study concluded that 78.2% of the citizens already has knowledge of adverse impacts of bad waste management to human health and the environment.[5] A similar study undertaken in the city of Vrbovec[6] provided a similar answer: 82.46% of the population thinks that textile waste is a threat to the environment. In the Croatian capital, the City of Zagreb, a study done by the Hrvoje Požar institute[7] revealed that 54.55% of citizens who don't recycle, don't do it due to the lack of infrastructure and thus shift the responsibility to the local governments. However the same study has shown that 98% of citizens agree with the claim that waste should be minimized to the lowest possible levels. All these studies have shown one interesting fact; it can be said, that citizens are aware of the problems waste creates in the environment. The next logical step for a society that has awareness is to provide it with policies, infrastructure and systems according to which they can act in a more environmentally friendly manner.

2.2.2. Problem within the legislative framework:

Although the topic of the research is widely regarded as the most important steps of the waste management hierarchy, only a few good existing strategies exist in the world. When the European Union prepared the revised Waste Framework Directive (WFD) in 2008, waste prevention and re-use measures were set as obligatory. The WFD stated in its Article 29 that Member States shall establish Waste Prevention Programmes no later than 12 December 2013. In the transition period from 2008 until the beginning of 2013, very little progress has been noticed across Europe and even less progress is visible in Croatia, a country which joined the EU on 1 July 2013.

A new Croatian Law on Sustainable Waste Management (official gazette 93/2013) was adopted on 15 July 2013 and presents a framework for future activities in the field of waste management, however the preparation of the national Waste Management Plan and Waste Prevention Strategy is scheduled for 2014 and the deadline for the prevention strategy will be most probably breached (12 December 2013).

The newly adopted Waste Act[8] very vaguely covers the prevention and re-use themes (which are the top priority of the waste hierarchy) – it simply inserts their definitions and the prescribed content of the national waste prevention strategy (which will be made later in 2013). The waste prevention plan or strategy will be part of the national Waste Management Plan in Croatia and as prescribed in the new Waste Act it will consist of goals for waste prevention and measures needed for achieving the goals for waste minimization and prevention.

---

5 Šimleša, D., Tarandek Galović, T., Galović, M., (2013), socioekonomska analiza gospodarenja otpadom u gradovima Osijeku i Subotici, Zagreb, Croatia (http://www.zeleni-osijek.hr/pdf/socioekonomska-analiza-gospodarenja-otpadom-u-osijeku-i-subotici.pdf)

6 Tarandek Galović, T., Galović, M., Jakuš, N., (2013). Centar za ponovnu upotrebu u Vrbovcu, istraživanje mogućnosti za implementaciju, Gradec, Croatia (http://www.irre.hr/mojwordpress/wp-content/uploads/2013/04/Obrada-reuse-ankete.pdf)

7 Bošnjak, R., (2012), Rezultati istraživanja o gospoadrenju otpadom i odvojenom sakupljanju otpada, Zagreb, Croatia

8 Zakon o održivom gospodarenju otpadom (NN 94/2013), http://hidra.srce.hr/arhiva/18/105517/narodne-novine.nn.hr/clanci/sluzbeni/2013_07_94_2123.html

Although the Croatian Waste Act does not mention a quantitative target for prevention and the European Union is currently revising the WFD in the area of target set ups (they failed to set up in 2008).[9] Although the WFD states that the re-use of waste will be encouraged by economic measures, procurement criteria and quantitative targets, the last option seems to be far away from being implemented in Croatia even if brought on an EU level by the end of 2014.

2.2.3. Waste prevention in Croatia

The overview of the official legislation gives very little references to re-use or prevention despite the fact that the general waste hierarchy gives those processes priority over other options like recycling or landfilling. The credit for certain prevention and re-use efforts has to be given to the Croatian Ministry of Environmental Matters and its Packaging and Packaging Waste ordinance[10] which regulates the handling of packaging and packaging waste, particularly with regards to the **obligations of the producer, importer, packaging manufacturer and retailer in the course** of its production, transport and use. This exact ordinance supported the use of refillable bottles (mostly water, juices and beer), taxed the other packaging and plastic bags but also developed a huge resistance from the industry which opposed the introduction of such an ordinance. After the Croatian Employers Organization proclaimed the Packaging Ordinance to be unconstitutional, the Croatian NGOs increased their activities to support the returnable packaging scheme. *»The Croatian Employers Organization has acted like the class dunce: it thinks that the efforts to reduce packaging should be postponed and re-designed«* stated environmental NGOs in a press release sent in 2005.[11] This was the first attempt by the Croatian authorities to introduce the polluters pay principle and encourage waste prevention, although the increased prices indicate that the financial burden was shifted to consumers. The results of this ordinance after 8 years of implementation show that a high share of beverage packaging is recycled but the prevention effect did not bring important results.

On the local level, there are few examples of private re-use initiatives such as the HumanaNova social cooperative who acts as a business guider in the Međimurje area and Reto Centar and Remar Centar who are volunteer associations dealing with ex addicts. HumanaNova focuses mostly on textile waste which is collected, sorted, re-distributed and sold in shops while Reto and Remar focus on household bulky waste. Although their work is highly environmentally sound, there is a big need for incentives in this area, as the process of waste collection is extremely complex for such ventures. These ventures are financed just by the sale of the re-used materials or recyclables and EU experiences show that this is simply not enough. All in all, these examples are individualistic and most Croatian cities and municipalities have no options for sustainable solutions for furniture, clothes, electrical appliances etc.

The reason why such initiatives do not replicate in other territories can be seen in the fact that the cheapest option for waste in Croatia is waste disposal. It is already widespread common sense that landfills pose a threat to the environment, but policy makers still tolerate such practices due to »social policy measures« (not raising the price of the waste services). Due to this fact, any improvement (recycling, re-use or preventative measures) represents only additional effort and burden to municipalities as the prices of collected materials

9 Official Website for the Targets Review Project http://www.wastetargetsreview.eu/section.php/4/1/consultation (viewed on 15.07.2013)

10 »Official Gazette« no. 97/05

11 http://www.glas-koncila.hr/index.php?option=com_php&Itemid=41&news_ID=5987

do not cover the expenses for running more advanced waste management systems. However, we haven't seen the evidences to back up these claims as landfill sanitation in Croatia is ultimately paid for by the municipalities and the National Fund for Environment and the sanitation of landfills usually costs more than a few million Euros of tax payers' money. If some of the waste had prevented in the past, the sanitation of old landfills would have cost less and the funds invested in the re-use sector would have increased employment rates and would support local economy in general.

HumanaNova social cooperative (Čakovec, Croatia)

The HumanaNova social cooperative is socially responsible company which encourages the employment of handicapped citizens and other socially disadvantaged people. In 2012, Humana Nova prevented more than 100 tonnes of textiles being landfilled. The materials are mostly collected through organized collections throughout the county, 10 installed collection containers are available. When the materials come to the sorting facility in Čakovec, they are sorted according to 4 categories; the 1st category presents clothes of sound quality which can immediately be re-sold in shops, the 2nd presents clothes which can still be used but need certain repairs (buttons missing, loose stitching etc), the 3rd category presents clothes which are not re-usable for the original purpose but are cut down into industrial material and used as the material for the production of new products and, only the worst, the 4th category is sent to recycling facility. The added value of this entrepreneurship is the fact that it re-uses textile waste materials from textile factories in the region. The environmental benefits of textile re-use are really significant, for example, the provision of one tonne of t-shirts into a reuse preparation network can result in a net greenhouse gases saving of 11 tonnes of CO_2 equivalent.

3. Policy options

However, the extent to which modern societies have »waste problems« varies dramatically because modern trends have shown new, greener and less expensive solutions for this type of environmental problem where waste is no longer material which people throw away, but new material for future re-production, re-design, and of course, re-use. EU member states annually landfill 5.25 billion Euros worth of recyclables like paper, glass, plastics, aluminium and iron. If such items were recycled, the equivalent of 148 million tonnes of CO_2 emissions could be avoided annually. Also, 90 million tonnes of food waste is produced every year in the EU[12], around 180 kg per person and around 40% of that biowaste is still going to landfills. During 2011, the European Union took a significant step towards the popularization and institutionalization of the term 'resource efficiency' by introducing the Resource Efficiency Flagship (REF) in January and the Resource Efficiency Roadmap in September 2011. **If waste is to become a resource to be fed back into the economy as a raw material,** as the European Commission in the Roadmap to a Resource Efficient Europe emphasises, **then much a higher priority needs to be placed on re-use and recycling.** Although the priority has also been set in Croatia, the hierarchy hasn't been followed so far.

The term prevention (which is at the top of the hierarchy) includes measures, which are taken before a substance, material or product has turned into waste and which reduce the following:

a) The amount of waste by reusing the products or extending their life time;
b) The harmful impacts on the environment and human health of the waste produced or
c) The content of harmful substances in materials and products.[13]

The waste hierarchy set in the WFD and Croatian legislation suggests that, after prevention, additional measures are prioritized prior to recycling and are also accountable for minimising the amount of waste. The WFD places preparation for re-use in second place of the hierarchy and this means, that any recovery method of checking, cleaning or repairing, by which products or components of products that have become waste, are prepared so that they can be re-used without further pre-treatment. Re-use as process is described as »any process in which products or components that are not considered as waste are used again for the same purpose that they were originally intended for«.

Since waste generation is affected by the state of the economy, in order to clearly isolate the effects of waste prevention activity, targets should ideally highlight the effects of waste prevention rather than the impact of changes in economic conditions (otherwise, 'waste prevention' may actually reflect depressed economic conditions). In principle, this is what is referred to in Article 9 (c) of the Waste Framework Directive, which suggests that where appropriate, by the end of 2014, waste prevention and decoupling objectives for 2020 **may be** established.[14] With regard to the re-use quantitative targets (which are mentioned in the WFD but are never clearly set out), the European Commission recognises the contribution

12 European Commission COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on Future steps in biowaste management in EU, Brussels, 18.5.2010 COM(2010)235 final

13 Dehoust, G., Kuppers, P., Bringezu, S. (2010.) Development of scientific and technical foundations for a national waste prevention programme, Umwelt Bundes Amt, Berlin, Germany, p.13

14 Eumonia, Oko Institute and Copenhagen Resource institute (2013)., Consultation on the Review of European Waste Management Targets, p. 28.

to resource efficiency that can be made through preparation for re-use. In principle, there are a range of waste types which could be targets for preparation for re-use, notably furniture and WEEE. However, setting targets for preparation for re-use for such materials is not considered to be that straightforward: the quantities are not generally well known across Member States, and the proportion of what is discarded, which can be sorted and repaired, may vary country to country.

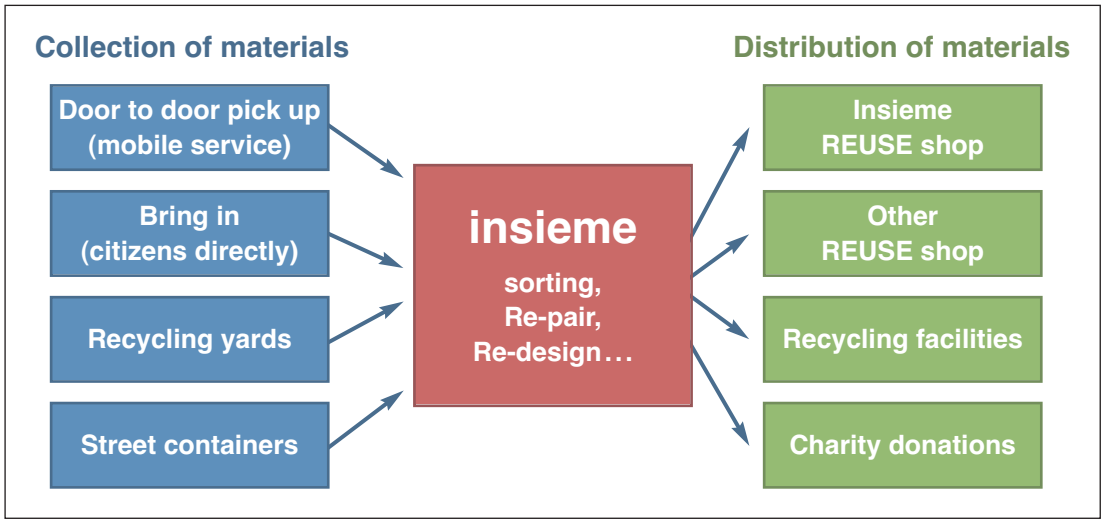
3.1. Obligations and motivation

The WFD states in Article 11 that Croatia shall take the appropriate measures to promote recycling and preparation for re-use such as the promotion **of the establishment and support of re-use and repair networks**, **use of economic instruments**, **procurement criteria** and **quantitative targets**. This signifies that Croatia should create a set of measures presented and adopted through the national Waste Prevention Programme. A recent German study took into consideration 300 examples of such measures collected as a starting point for the consolidation and clustering of possible solutions which could be included in the German National Waste Prevention Plan. The study in section C VII: waste prevention discarding, states, that in this field, such measures proposed seek to promote second hand trade and re-processing structures. These measures should be further supported through conducive framework conditions in the shaping of waste charges and through the incentive effects of economic instruments.[15] This study recommends;

- Collocation of charges in line with the 'polluter pays' principle, for instance, through weight or volume based waste charges, accompanied with advice on waste prevention
- Technical, organizational and financial support for second hand exchanges and shops
- Support for repair networks
- Support for the distribution of surplus food to the needy... and many more.

3.2. Re-use and repair networks

The purpose of re-use centres/shops/networks is to collect and re-distribute products (clothes, books, electronic and electric equipment, computers, tools, furniture, food etc.) which are, in the broadest term, still usable, useful and needed to someone – from those who don't need them anymore.



15 Dehoust, G., et.al. (2013), abfallvermeidungsprogramm, Umwelt Bundes Amt, Dessau – Rosslau, Germany

There are many channels involved in the collection of products. The first channel is the collection of goods (products) through the organisation of mobile services which collect items directly from citizens' apartments, the second involves special street containers to which citizens can deliver clothes, books and smaller appliances and the third channel gives the possibility to citizens of bringing in the materials directly to the centre where the items are sorted. The sorting of gathered materials is carried out mainly for the purpose of usability of the collected items. For example; it is expected that the clothes are not damaged, computers to support basic technical requirements, furniture to be repairable if damaged etc. In the process of sorting, the intact products are sent to further preparation for marketing while non usable materials are prepared for recycling. Preparation for marketing (or preparation for re-use) consists basically of processes such as disinfection, cleaning of shoes and clothes, repairing and redesigning of furniture, labelling etc. In the end, these materials are sent to »second hand« stores all around the world (but we would prefer to have local distribution due to transport pollution). Centres for re-use across Europe are comfortable with the employment of socially disadvantaged people and thus represent valuable business opportunities for the society[16] due to their social, environmental and green economy attitude. The potential in discarded materials can be estimated in economical terms (financial values of materials), environmental terms (CO_2 potential, underground water pollution...) but also in the potential lifetime for each material. The trade in second hand clothing is, for example, dominated by not-for-profit organizations such as charities or NGOs (Farrant, 2008). It is estimated that about 70% of clothes' potential lifetime remains when they are discarded (Salvation Army, 2008.). The potential for re-use is therefore significant.[17]

So far, such examples do not exist in Croatia and by organizing such schemes in Croatia – a significant amount of waste would be avoided, numerous working places would be opened and local economies would be supported.

3.3. What are the economic instruments available?

As indicated in the problem analyses, successful prevention strategies do not exist without firm economic incentives frameworks as most of the collected materials require higher costs to collect than their re-sale value.

3.3.1. Fees and taxes

Policies which rely on increasing the costs of landfill fees (a special price which is to be paid for the disposal of unsorted municipal solid waste) and taxes are *per se* not effective in decreasing the amounts of waste produced. However, the systematic influencing of waste disposal fees by specific charging systems based on volume or weight, particularly in certain cases where these are accompanied by targeted public relations measures, is efficient as a waste prevention measure.[18] The following table has been produced as part of a scientific paper called »the economic aspects of waste management after the implementation of waste management centre infrastructure in Croatia«.[19]

16 In the United Kingdom, the most common re-use entities are called charity shops.

17 WRAP (2011.), Benefits of reuse, Case Study: Clothing, London, UK

18 Dehoust, G., Kuppers, P., Bringezu, S. (2010.) Development of scientific and technical foundations for a national waste prevention programme, Umwelt Bundes Amt, Berlin, Germany, p. 24

19 Galović, M., (2008). »Ekonomski aspekti gospodarenja otpadom nakon implementacije centara za gospodarenje otpadom«, Međunarodni simpozij gospodarenje otpadom Zagreb, Zagreb, Croatia

Present	Future
Landfilling is the cheapest option for waste management	Landfilling of waste is forbidden without prior treatment with high running costs
Separate collections of wastes are not economically viable	Separate collections of wastes are prescribed by laws and targets
Municipal waste companies rarely decide to improve their management systems	Municipal waste companies have to improve their management systems and recognize the economic benefits of such systems

By entering the European Union, such practices have to become »past« because of the obligations stated in the EU environmental acquis. This will, in practice, mean that the landfilling of waste will be paid (it is currently is free of charge) through 2 separate taxes; firstly – for every tonne of waste landfilled and secondly for every tonne of biodegradable waste landfilled below the national target.[20] In this case – separate waste collections, re-use infrastructure and prevention measures become the instruments for lowering the waste management budget – and represent the tools for creating savings for local authorities.

The new study created by the European Institute for Environmental Policy (IEEP) and commissioned by the European Commission confirmed that there is a connection between the landfill fees and taxes in some countries and sustainability of their waste management system. The purpose of the study was to analyse the economic instruments in waste management, identify obstacles for using such instruments and which strategies gave best results in Europe. IEEP identified that currently, 19 EU Member States have implemented the landfill tax (which varies from 3 EUR in Bulgaria to 108 EUR in Netherlands) and that countries with higher tax also have higher prevention and recycling results (except Denmark, France, Ireland and Poland where the tax didn't create the expected results). [21]

The funds saved by any operation which avoids waste landfilling or treatment and thus saves public funds for other waste management options is called *»recycling credit«*.

3.3.2. Environmental credit rationale

The recycling credit scheme was an early initiative to incentivise recycling and the re-use of household waste by local authorities and third parties (e.g. community groups, businesses and other organizations carrying out recycling or preventive activities) and it is recommended for introduction on a local level in Croatia. In the absence of a direct charge for collecting or disposing of household waste (with minor exceptions), there was no direct financial initiative to avoid collection or disposal costs by recycling waste instead. The scheme's purpose is to make available the savings in disposal and collection costs to recyclers, which result from recycling household waste. In the UK, the scheme was introduced due to section 53 of the Environmental Protection Act from 1990 in the absence of other policy levers to encourage recycling, but today, it has to operate in conjunction with a number of other economic and regulatory measures designed to promote more sustainable waste management.[22]

---

20 System will change after the implementation of waste treatment facilities.

21 Institute for European Environmental Policy (2011). The Use of Economic Instruments and Waste Management Performances, Background report for stakeholder meeting http://ec.europa.eu/environment/waste/pdf/strategy/Background%20Report%20Waste%20EIs%20251011%20-%20final.pdf

22 Department for Environment, Food and Rural Affairs (2006.), »Guidance on the Recycling Credit Scheme«, London, UK

These credits are only to be paid for ***waste,*** which is recycled or re-used. The sale of second hand books, clothes or furniture, and the use of returnable or refillable bottles or containers are not eligible for credit payments. For example, goods donated to charity shops are not classified as waste at the point of donation, therefore re-use shops and networks are not eligible to receive recycling credits on such »goods« donated to their organization (charity, social cooperatives, and businesses). With regard to products that leave the organizations as waste (and are not sold as goods) and are sent to recycling facilities – this waste *is* eligible for recycling credits. The recycling credits can be also avoided when local authorities initiate contracts with fixed fees for public services for re-use organizations to conduct. It is additionally important for local waste authorities to have their own controls in place with regards to the payment of credits that are sufficient to prevent error or fraud. Waste authorities will wish to assure themselves through such controls, that: the tonnage of waste on which credits is claimed is as stated, the waste originates from the area of the local authority and the waste for which credits are claimed is sent to the registered recycling or re-use facilities. The calculation of the credit value is based on regulation, in the UK it is done as follows: »Calculating the average cost per tonne of waste disposal for similar waste in the previous fiscal year using the authority's most expensive form of disposal in each area.« This basically means that re-use organizations in Croatia could, as of the date of implementation of the landfill taxes, receive the same amounts of funds per tonne of waste re-used or recycled by the local authorities (or their companies which represent the waste collection authorities).

3.3.3. Legislative enforcements in the service of re-use of waste

In addition to the traditional re-use of furniture, clothes, shoes, household appliances and toys, re-use was once common in other industries, especially in beverage production. One glass container can be refilled 30 times and this way replaces more than 30 environmentally costly plastic containers which cannot easily be re-used.[23] The environmental guidance for the 21st century has to be to care for the environment in order to preserve it for future generations.[24] Most promisingly, legislative acts which could enforce the re-use of materials are targeted in terms of the re-use of packaging for food and drinks which are followed with bans or taxation of products which do not comply with the targets. In order to discourage further debates on whether re-use is more environmentally friendly than single use PET packaging, several studies have been conducted. A comparison of 5 life cycle analyses which compared re-usable variants with PET single use packaging has shown that re-use packaging is environmentally sounder in all the categories examined. Only one study gave higher scores to PET in one category and this category was the discharge of carbon monoxide while carbon dioxide, methane, sulphate and nitrogen oxides, waste pollution and general wastes are clearly supported more on the reusable side.[25]

Educational campaigns such as the demonstration of the benefits of re-usable packaging, the minimisation of plastic shopping bags and reducing the usage of single use batteries and switching to refillable ones can also stimulate citizens' interest towards the waste management theme. On the local level, products which have no future in the recycling cycle have to be recognized. Local governments can organize campaigns or even ban certain types of

23 New developments points that plastic containers can be reused.

24 From the definition of sustainable development.

25 Institute for Local Self – Reliance (2002). »Environmental Benefits of Refillable Beverage Containers«, Washington, D.C. http://www.grrn.org/beverage/refillables/ecologic.html,

products which cannot be properly re-used, repaired, recycled or composted. More and more cities and municipalities worldwide have banned plastic bags or implemented taxes for their usage. The results of such decisions are more than positive. The example from Ireland has shown that implementation of such a tax has resulted in a reduction of plastic shopping bag usage by 90%.

3.3.4. Summarized benefits (eco-env-social)[26]

One of the most common excuses for not implementing advanced waste management schemes and re-use projects in Croatia is that such projects are not financially sustainable. It is indeed true that higher fees will be requested from citizens (users of the services) – but these increases will not avoidable as landfilling or the treatment of waste will have to paid for in near future anyway. Imagine this: you have 100 EUR and you can choose your options for that amount of money; you can give the whole amount to landfill authorities or you can subsidize the recycling authorities with 50 EUR, re-use and prevention companies with 20 EUR and the remaining funds you have to spend for the waste you didn't recycle or avoided.

Re-use is labour intensive as it involves collection, sorting, testing, refurbishment and re-selling which is important considering the EU and Croatian average unemployment rate. Social enterprises working in the field of re-use provide opportunities for those distanced from the labour market to gain key skills such as driving commercial vehicles, carpentry, electrical engineering or marketing. Some even embark on intricate trash design or eco-fashion activities.

Regarding the economic benefits, it costs France 20,000 EUR to support an unemployed person. Through the funding of integration contracts in the field of textile collection, re-use and recycling, the state still only pays half this and ends up saving 2 Euros for every Euro spent. At the same time, it improves the skill set of the workers and boosts green jobs.[27] In the UK, a WRAP study (2011) estimates that re-use of a selection of waste streams brings benefits of 720 million Pounds of savings to the economy. The Illinois Department of Commerce and Economic Opportunity estimates that for every 1000 tonnes of electronics, 15 jobs can be established in recycling whilst up to 200 jobs shall exist through refurbishment and repairs.[28]

All the benefits are translatable to any country's situation – but, at this moment, political support is needed to boost these activities so that they become important economic development tools in Croatia. The current state of awareness of the Croatian citizens is rather high and more than 78.7% of citizens questioned agree that the current behavioural pattern will lead our world towards environmental disaster and, at the same time, 87.2% agree that politicians don't do enough to protect the environment (D. Simlesa, T. T. Galović, M. Galović 2012, Socioekonomska analiza gospodarenja otpadom u Gradovima Osijeku i Subotici, Zelena akcija)

26 Economically – environmentally – socially

27 Relais, L. (2012). Dossier de Presse

28 DECO (2009). »Electronic Recycling, Economic Opportunities and Environmental Impacts.« (http://www.illinoisbiz.biz/NR/rdonlyres/8DD41FE3-A7ED-4447-87C0-DD05815F2747/0/EwasteFactSheet.pdf)

4. Conclusions and recommendations

In order to satisfy the requirements stated in the Waste Framework Directive, Croatia shall prepare its National Waste Prevention Programme (NWPP) by the end of 2013 or it will face the consequences of breaching the EU legislation acquis. However, this issue should not affect the quality of the prepared prevention programme due to the limited time on disposition. The Waste Prevention Programme should be developed in line with the WFD and support the re-use networks and create a positive financial environment for such activities (economic instruments) and discourage industries from producing products which create excessive amounts of waste. As we have discovered throughout this paper, the Waste Prevention Programmes are perfect tools for boosting local economies, integration of socially disadvantaged populations and preserving the environment and we recommend that Croatian National Waste Prevention Programme should be elaborated in order to include following main elements:

a) **Open and support re-use centres** – the establishment of re-use centres is usually a private initiative within Europe and thus does not take capacity of local administrations. In Scotland, for example, social enterprises and charities play a key role in the management of furniture waste from households and businesses. Similar cases are to be found in Italy, Belgium, other parts of the UK, Germany and even Croatia. Regarding support, local authorities may advise residents to donate unwanted products to the local re-use centre (social enterprises or charities). They may be prepared for re-use here or dismantled in order to recover materials (wood, metals, plastics etc).

b) **Set separate re-use targets (from recycling ones)** – legally binding targets for re-use are needed in order to make the re-use of materials (equipment, furniture, electronic appliances etc.) obligatory for cities and municipalities. Although the target is not set by the European Commission, we believe that Croatia should introduce targets today as the EC is currently conducting public consultation on this matter and legislative proposals could be made in next few years. Targets would help open up responsibility schemes to producers in order for them help achieve such targets and generate national investments into setting up networks of re-use centres.

c) **Economic incentives** – on a national level, reducing taxes like VAT on repair-work may boost the viability of the repair work and make repairs and refurbishments cheaper. The state could shift some of these taxes onto certain natural resources used for making new products or from polluters' funds in general. The introduction of waste disposal fees in Croatia already created the preconditions for the introduction of certain environmental credits schemes which can be regulated on a national level and implemented on a local level. With this, the economic viability of the re-use sector would be significantly increased.

Additional elements of the programme should be constant and the **interactive education** of citizens on all of the aspects of waste prevention (where and how to shop in environmentally sound ways, advice for the end destination of each non-usable product etc.). There are several ways to tackle the industry for more rational behaviour and the NWPP should identify and **introduce taxes and/or bans** on certain products which cannot be captured within the re-use schemes (non rechargeable batteries, non returnable packaging for beverages, multi-material products which cannot be dismantled and recycled etc.

Therefore, the combination of financial instruments, laws, information, incentives, institutions and service delivery will get Croatia on the right track to satisfying the waste hierarchy and create a more sustainable economy.

Bibliography

1. Agencija za zaštitu okoliša, Izvješće o komunalnom otpadu 2011, http://www.azo.hr/lgs.axd?t=16&id=4707 (viewed on 15.08.2013)
2. Bošnjak, R., (2012), Rezultati istraživanja o gospoadrenju otpadom i odvojenom sakupljanju otpada, Zagreb, Croatia
3. Burke, H., Morrish, L., Ripper, B., (2012). Re-Use and recycling options appraisal for stuffing materials, Zero Waste Scotland, Scotland
4. European Commision COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on Future steps in biowaste management in EU, Brussels, 18.5.2010 COM(2010)235 final
5. DECO (2009). »Electronic Recycling, Economic Opportunities and Environmental Impacts.« http://www.illinoisbiz.biz/NR/rdonlyres/8DD41FE3-A7ED-4447-87C0-DD05815F2747/0/EwasteFactSheet.pdf
6. Dehoust, G., Kuppers, P., Bringezu, S. (2010.) Development of scientific and technical foundations for a national Waste Prevention Programme, Umwelt Bundes Amt, Berlin, Germany,
7. Dehoust, G., et.al. (2013), abfallvermeidungsprogramm, Umwelt Bundes Amt, Dessau – Rosslau, Germany
8. Department for Environment, Food and Rural Affairs (2006.), »Guidance on the Recycling Credit Scheme«, London, UK
9. Eumonia, Oko Institute and Copenhagen Resource institute (2013)., Consultation on the Review of European Waste Management Targets
10. Galović, M., (2008). »Ekonomski aspekti gospodarenja otpadom nakon implementacije centara za gospodarenje otpadom«, Međunarosni simpozij gospodarenje otpadom Zagreb, Zagreb, Croatia
11. Greater London Authority (2008)., Third Sector Re-use Capacity in London, London, UK
12. Guillet, R., (2008), Using carbon balance to evaluate CO_2 impact of reduction of waste, ACR+, London.
13. Henningsen, T., Osborne, A., Lee, B., (2010). household Waste Management – Re-use, University of Kentucky, US
14. Institute for European Environmental Policy (2011). The Use of Economic Instruments and Waste Management Performances, Background report for stakeholder meeting http://ec.europa.eu/environment/waste/pdf/strategy/Background%20Report%20Waste%20EIs%20251011%20-%20final.pdf
15. Institute for Local Self – Reliance (2002). »Environmental Benefits of Refillable Beverage Containers«, Washington, D.C. http://www.grrn.org/beverage/refillables/ecologic.html,
16. Kay, T., Essex, J., (2011). Pushing re-use, Towards a low-carbon industry, BioRegional, Wallington, UK
17. McLaughlin, J., (21.09.2013), Entrepreneurship, Kerbside recycling and Participation, Valpovo, Croatia http://www.otpad.eu/repos/prezentacije/Jim%20McLaughlin%20ZWAUK%20Presentation%20Croatia%2021092012.pdf

18. Simpson, A., (21.09.2012). Re-use sector overview, Valpovo, Croatia http://www.otpad.eu/repos/prezentacije/Simpson%20-%20Refurnish%20Presentation%20CROATIA%20v2.pdf

19. Šimleša, D., Tarandek Galović, T., Galović, M., (2013), socioekonomska analiza gospodarenja otpadom u gradovima Osijeku i Subotici, Zagreb, Croatia http://www.zeleni-osijek.hr/pdf/socioekonomska-analiza-gospodarenja-otpadom-u-osijeku-i-subotici.pdf

20. Tarandek Galović, T., Galović, M., Jakuš, N., (2013). Centar za ponovnu upotrebu u Vrbovcu, istraživanje mogućnosti za implementaciju, Gradec, Croatia http://www.irre.hr/mojwordpress/wp-content/uploads/2013/04/Obrada-re-use-ankete.pdf

21. Targets Review Project (official website) http://www.wastetargetsreview.eu/section.php/4/1/consultation

22. Zakon o održivom gospodarenju otpadom (NN 94/2013), http://hidra.srce.hr/arhiva/18/105517/narodne-novine.nn.hr/clanci/sluzbeni/2013_07_94_2123.html

23. Wilts, H., (2013). Drivers and Barriers for Waste Prevention – Expiriences from European Waste Prevention Programmes. RCBC 39th Zero Waste Conference 2013, Whistler, UK

24. WRAP (2011.), Benefits of re-use, Case Study: Clothing, London, UK

5. Appendix: case studies of prevention schemes

5.1.1. Social enterprise re-read (Doncaster, United Kingdom)[29]

In Croatia, a certain culture of re-using old books exists mainly due to the re-sale of books through specialized shops. However – most of the cities and municipalities do not have such specialized shops and the books are mainly pre-destined for landfilling (as most of the cities and municipalities still don't even have paper recycling opportunities). Re-read is no classic book store (as classic book stores only pick the »best items«) but it finds ways to distribute all the books to the new owners with affordable prices (besides local shops – the books are shipped all over the world through internet platforms such as amazon.com). When the books are obtained by Re-read, they are sorted and classified according their future distribution (separation of books for sale and ones which go down other distribution channels). Re-read cooperates with a lot of partner organizations like volunteer associations, charity organizations, schools, hospitals and retirement homes to whom the books are donated for free. Only totally unusable books are sold for recycling purposes (nothing is wasted!). The socially responsible re-use sector in United Kingdom currently employs more than 3,000 citizens, trains more than 8,000 trainees and has more than 10,000 volunteers. These human resources directly supports 750,000 households with lower incomes and saves more than 330 million pounds per year. Every year more than 90,000 items of furniture and electric appliances are re-used and this saves approximately 100,000 tonnes CO_2 emissions every year.

5.1.2. Bicycle repair shop (Zagreb, Croatia)

Among the other services that the bicycle repair shop offers, which is organized by the Croatian non-governmental organization 'Zelena Akcija', it provides cyclists with the program of reusing old bike parts, which is a perfect example of re-use solutions. The aim of this project is to prevent disposal of bicycles and parts that are still usable. The repair shop collects old bikes in order to restore them or use them for parts. The bikes are repaired or reassembled and donated to citizens with a poor economic status. This way, the bicycle repair shop saves natural resources and energy and financially contributes to citizens with lesser incomes. This program is completely volunteer based.

5.1.3. Refurnish (Doncaster – United Kingdom)[30]

29 Based on Lecture McLaughlin, J., (21.09.2013), Entrepreneurship, Kerbside recycling and Participation, Valpovo, Croatia (http://www.otpad.eu/repos/prezentacije/Jim%20McLaughlin%20ZWAUK%20Presentation%20Croatia%2021092012.pdf)

30 Based on lecture from Simpson, A., (21.09.2012). Reuse sector overview, Valpovo, Croatia (http://www.otpad.eu/repos/prezentacije/Simpson%20-%20Refurnish%20Presentation%20CROATIA%20v2.pdf)

The mission of the Refurnish Company is to prevent waste and turn materials into new usable items. The company was established in 2003 with the aim of preventing the dumping of functional and usable furniture onto landfills. Refurnish promotes recycling habits and responsible behaviour towards nature by collecting, re-designing and repairing furniture in order for it to be re-sold to the local community at affordable prices. In the beginning, a small team of employees achieved success after success and this project became a successful social entrepreneurship in very short time. The project operates in the city of Doncaster and its surroundings. Currently many of the employees are citizens which may be unfortunately labelled as 'unemployable' in some respects (with special needs or handicapped) but are trained here and their skills are improved along with their experience and confidence. Such a working environment has also been recognized by the Doncaster Business Association who rewarded the company with the award: »employer of the year 2010 – for exceptional accomplishments«.

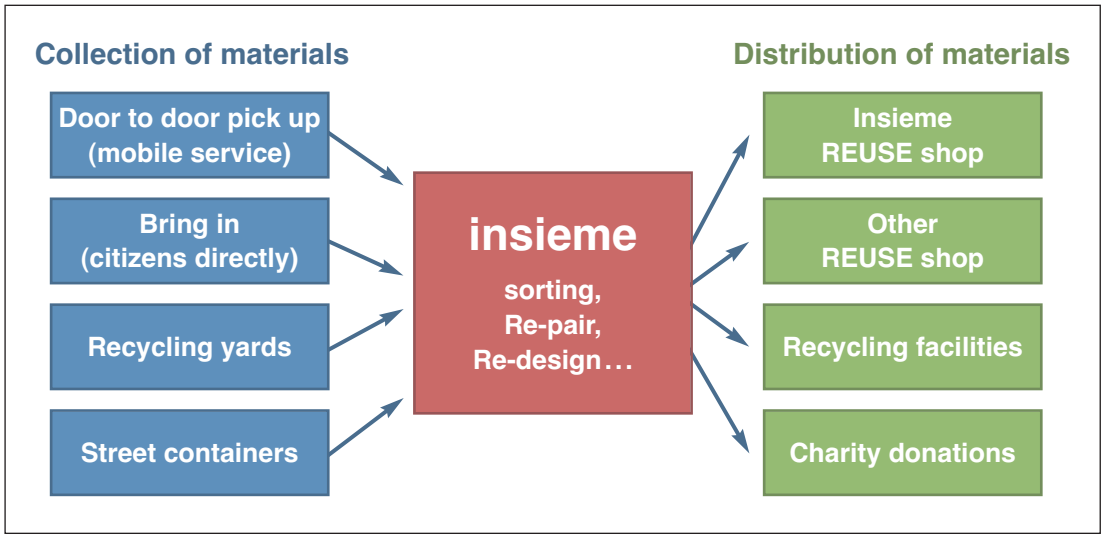
Besides collection of furniture and electric and electronic appliances which are donated by citizens, Refurnish also provides a collection service for bulky waste from the citzens.[31] In Croatia such a service is usually provided by municipal companies and collected waste is usually only discarded on landfills. As this type of waste is easilly repairable and prepared for reuse, the products can be easily sold on at affordable prices. Might this be an idea for starting similar enterpreneurship in Croatia? Every city and municipality can profit from such a service.

31 Concession received by city authorities awarded through public call.

Refurnish guarantees that all the collected materials will be re-used and recycled in the most environmentally preferred option, and it is important to emphasise that this company is not-for-profit and that all the eventual profits are invested in the development of the society at the end of the year (parks and playgrounds for children, renovation of kindergartens and retirement homes etc.)

5.1.4. Social Cooperative Insieme (Vicenza, Italy)

The Social, not-for-profit, Cooperative Insieme was founded in 1979 by a group of citizens who were feeling the need to share deeper discussions and have a united approach towards their quality of life, especially focusing on work-related issues, social exclusion and youth disadvantage. Currently the cooperative counts around 90[32] workers/members and some volunteer members in its group and there are about 40 places available for individuals taking part in work integration and support programmes. The mission of the cooperative is to promote and develop two fundamental aspects of social cooperation; a) the production of activities aimed at the creation of educational programmes for disadvantaged people through the involvement of such people in work experiences and b) services provided directly to the citizens. This has been possible thanks to the efforts made by the cooperative in order to interact with the local community. All of these accomplishments and goals are carried out through the provision of separate waste collection services and the management of second hand retail shops. The cooperative has developed a great quality system for the collection of reusable waste; there are over 20 waste categories throughout their 3 waste collection points, numerous containers all around the city, direct collection at the cooperative headquarters and direct door to door collection of waste which is a service carried out on behalf of municipalities, companies and other consortiums. According to the agreed terms and conditions of the agreement, the service is free and covers a maximum of 5 items being implemented on a regular basis. All these materials are sorted and then re-sold or recycled. Very few materials are discarded in the end. Vicenza definitely showcases itself as one of the most widespread re-use companies and presents a model for replication in Croatia due to its great environmental, social and social impact.



32 Including professional support of 7 educators, 2 social workers, 4 assistance operators and 31 technical and administrative professionals.

Notes: