

# The necessity of integrated approaches to waste management in the European Union

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**Abstract.** Waste management must be integrated into sustainable development strategy that has as priorities on this chapter to prevent waste, to reduce the amount of energy and resources and minimizing emissions at source. This paper presents the main approaches to waste management in the European Union (EU). The paper shows the initiatives which underlying the reduction in waste, waste pressure on the environment, the principles used in waste management. The paper also shows the policies and the strategies used in waste management, waste management trends in the EU and the initiatives of EU in this field.

**Key Words:** waste, management, strategy, sustainability.

**Introduction.** Currently, the ecological footprint (the pressure exerted by humans on the biosphere depending on the Earth's productive area necessary for providing natural resources and to absorb waste products) available is 1.8 global hectares (hag), but an European man has a footprint of 4.9 hag and a north American man has 5.8 hag so we use the equivalent of 1.3 planets. United Nations (UN) reports show that if we continue at the same pace in 2030 we will need two planets.

Therefore, waste management must be integrated into sustainable development strategy which has the priorities in this chapter the waste prevention, reducing the amount of energy and resources, and minimizing emissions at source. Only efficient waste management, including recycling does not solve the problem of increasing the amount of waste. Waste must be treated as part of the total flow of materials used, future resource inputs for treatment and disposal should be avoided. To reduce or even stabilize the waste amount it takes many initiatives:

- clean technology;
- develop products based on life-cycle analysis;
- design for disassembly;
- systems of environment management in manufacturing;
- re-use of products and packages;
- improving the quality of the products taking account of the lifetime;
- increase chance to repair the products;
- increase reuse or repair the components from waste products;
- increase consumer awareness about the need to change lifestyles.

It is also necessary to integrate waste management in other sectoral policies. It is important to integrate the problem of waste in the working guides on best available techniques.

A gradual substitution of taxes work with energy taxes and raw materials is probably the most effective and efficient way to obtain the effective management of resources in a free market economy. This can only be done by limiting the individual expansion of the member states because of that their national industries have higher costs than their international competitors, except when they are offset by reduced labor costs.

Waste prevention is invariably the best method of environmental protection of all methods of waste management. Not only avoids waste processing but also eliminates the burden associated with the production of materials that are primarily waste.

There are 3 main problems:

- lack of quantifiable and standardized information;
- inadequate implementation of EU legislation at national level;
- delays in the adoption of more integrated environmental measures such as the economic instruments and voluntary agreements to encourage greater responsibility of producers and consumers.

Through effective waste management policies we can reduce 3 types of pressure on natural capital (NC):

- negative impact caused by extraction of raw materials;
- emissions from waste treatment facilities;
- air pollution and emissions of greenhouse gases from waste transport and production processes.

Although as a result of recycling results a negative impact on the NC, however this is lower than the impact of the primary extraction of the raw materials. Reducing the amount of waste produced has the lowest negative impact on NC but nevertheless policies to reduce waste generation were quite rare and often ineffective.

**The principle of life cycle analysis.** At EU level, the life cycle was introduced as a guiding principle in waste management so that is taken into account the entire life cycle of both services and products when assessing the environmental impact (Figure 1). Because it takes into account the life cycle of products and services can prevent or at least minimize the environmental burden shifting from one stage to another of this cycle, and especially from one country to another.

The idea of life cycle affects not only the environment but also most of sectoral policies - through the use of materials and energy from waste, a reduction in emissions, and re-use of land which has already been developed.

Furthermore, the EU has set a strategic goal to move toward more sustainable patterns of consumption and production, in order to decouple use of resource and production of waste by environmental impacts and become the best economic model in the world (EEA 2010).

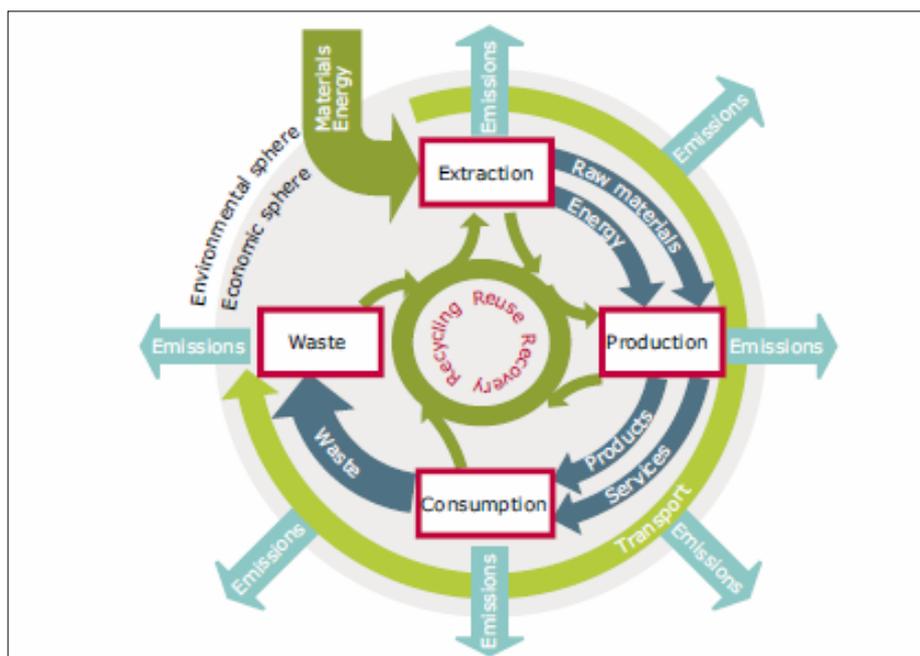


Figure 1. Lyfe cycle chain: extraction - production - consumption – waste  
(Source: <http://www.eea.europa.eu>).

**Waste policies and strategies in the EU.** Waste management in Europe and particularly the management of waste disposal and recovery are partly governed by the rules of market economy but are also influenced by numerous national and EU regulations. The success of the community strategy on waste depends on a complex system governed by different national and regional regulation, capacity of treatment facilities and price of treatment forms in various countries. So the knowledge about supply and demand relating recovery capability, thermal treatment and disposal as well as the prices are needed to assess waste management.

According to the policy framework, a community strategy on waste management was initially adopted by the EC in 1989. The strategy set 4 strategic guidelines: prevention, recycling and recovery, optimization of final disposal, transport regulation, together with a number of recommended actions.

The main guidelines have been maintained in 1996 when it was revised Community strategy, adding that it should be preferred recovering materials with energy recovery.

The Community Strategy for Waste Management aims to establish an integrated waste management and lays down a series of hierarchical principles, giving a high priority to waste prevention, followed by reuse and recycling, energy recovery and final disposal in landfills. Other EU strategy on waste are: Thematic Strategy on Prevention and Recycling of Waste and the Thematic Strategy on the sustainable use of natural resources.

The Resource Efficiency Roadmap, within the Strategy, asks turning waste into resources. To achieve this goal it is necessary that the entire EU to strictly apply the waste hierarchy and to fully implement EU legislation on waste. Also the landfill waste to be eliminated, recycled waste should be used as the main source of raw materials, should be reduced to generate all types of waste especially hazardous waste, illegal shipments of waste must be eliminated, energy recovery must be limited to non-recyclable waste. All these goals can be achieved through the use of market-based instruments and measures.

The 7th Environment Programme "A better life within the limits of our planet" was launched by the European Commission in late 2012 and sets the framework for EU environmental policy by 2020. Goal of the program is to transform the economy of Community into a sustainable green economy. Strategy set out is quite flexible so that it can easily adapt to the challenges that appear.

**Trends in waste management in the EU.** EU has problems on sustainable waste management due to the rapid development of consumption and due to the rapid development of the industry and services. Although at the EU level there are clear targets for reducing the amount of waste generated, waste generation actually increased in many Member States, but of course there are variations from state to state due to different social and economic structure.

Overall, in 2006 have been generated approximately 3 billion tonnes of waste in the EU 27. The current data show that the waste stream of electrical equipment and household appliances has fastest growing followed by the flow of hazardous waste.

A substantially increased the amount of packaging waste as well as waste from demolition and construction. Of the 3 billion tonnes of waste, about half were recovered, recycled, disposed of or incinerated. The other half was deposited in landfills, some nonconforming (Source: The report "European environment, status and perspective 2010, the summary", 2010, EEA).

In general, it is expected that in future, waste elimination in deposits decrease and instead to increase recycling and incineration with energy recovery. This will represent some progress in waste management in Europe, although there will continue to be produced hazardous waste and toxic emissions from incinerators and recycling plants will also produce secondary waste and emissions. Increased efforts to avoid waste, removal of toxic compounds from materials where feasible and source separation could alleviate these problems.

Action Plan on Sustainable Consumption and Production and Sustainable Industrial Policies (Plan SCP/SIP) was adopted in 2008 by the EC and includes proposals to improve the environmental performance of products and increase the demand for products and production technologies sustainable in particular by improving energy and environmental performance of products and foster their uptake by consumers.

Expected trends in the area of waste in the near future suggests that existing policies, although they have some success are not sufficient to stabilize increase in the quantity of waste, achieving the policy objectives in the field or making progress toward

sustainability. Future EU policy on waste has a high importance from the point of view of the possibilities to reduce the quantity of waste.

Waste management in Europe and in particular management disposal and recovery of waste are partly governed by the rules of the market economy but are also influenced by countless EU and national regulations. So, the success Community strategy on waste depends on a complex system governed by different national rules and regulations and regional capacity, on ability of the treatment facilities and on the treatment forms price in various countries. Therefore, knowledge of supply and demand on recovery capabilities, heat treatment and storage and as well the prices are needed to assess waste management.

Strategies and effective waste management policies that result, in addition to lowering the environmental impact and thus reduce environmental risks and create economic opportunities. Thus, 0.75% of EU GDP comes from different ways of waste management, including recycling (Source: Lead Market Initiative for Europe, report, CE, 2009).

Fifty percent of the waste and recycling industry worldwide and 30% of the eco-industries worldwide belong EU. The recycling industry involving about 500,000 people and turnover is approximately 24 billion euros (Source: Lead Market Initiative for Europe, report, CE, 2007).

EU Directive on waste requires the Member States to carry out an integrated and adequate network of installations for the disposal of waste. This can be carried out in cooperation with other Member States. The network must be available for the Community as a whole and of sufficient capacity for the disposal of waste and should reflect that certain wastes, in particular hazardous wastes are not generated in a given country in a quantity so high as to endanger the facilities dedicated waste disposal in that State.

Transboundary shipment of waste is increasing due to the requirement for reusable and recyclable waste and for energy recovery. However, if in the destination countries, waste are not properly treated result in a loss of resources. Another reason for the transboundary movement of waste is the lack of treatment capacity of the hazardous waste in source countries, lower costs for waste management in destination countries and different environmental standards.

As said before, the impact on the environment and on the use of resources can be minimized due to assess the life cycle. At the level of Europe there is a prioritization of stages of waste management: waste prevention, reuse products, recycling waste, recovery of materials from waste, energy recovery from waste incineration, disposal.

However, at the level of the Member States, there are variations in waste management and hence different impact on the environment. These variations are determined by different facilities for waste management (in some Member States these capabilities are insufficient, and/or ineffective and/or which do not comply with the European legislation), the different level of awareness of the effects of waste on the environment and human health, lack or non-application of fees in this field, in particular as regards the sorting at source the waste. Also, encouraging sustainable consumption, the effective enforcement of the rules in force, the efficient use of resources in production are ways of preventing or at least reducing the amount of waste produced and by default minimizing risks arising in waste management.

Although waste prevention is the most effective mechanism to reduce the risk caused by waste, at European level, the policies and strategies on prevention are few and often ineffective. One of these policies relate to the use of bio-waste, including food, e.g. composting and avoid disposal to landfill. But these types of waste reduction can also be achieved by a different approach to the production of foods and consumption chain so that resources are used efficiently. In this way the impact on ground and surface water and groundwater is less.

**EU initiatives.** In 2009, the EU launched the project The European Week for Waste Reduction (EWWR). This project, which runs in present, financed by funds LIFE+, aims to promote the awareness and inform the public on sustainable resource use and waste management. The shares are held within a week. In 2014, EWWR occurs between 22 and

30 November. In actions is involved a wide range of public: public authorities, civil society, private companies, citizens.

EWWR's objectives are: to mobilise and encourage European citizens to concentrate on 4 key action themes (Figure 2), reduce amount of waste, reuse of waste, recycle of waste, energy recovery.

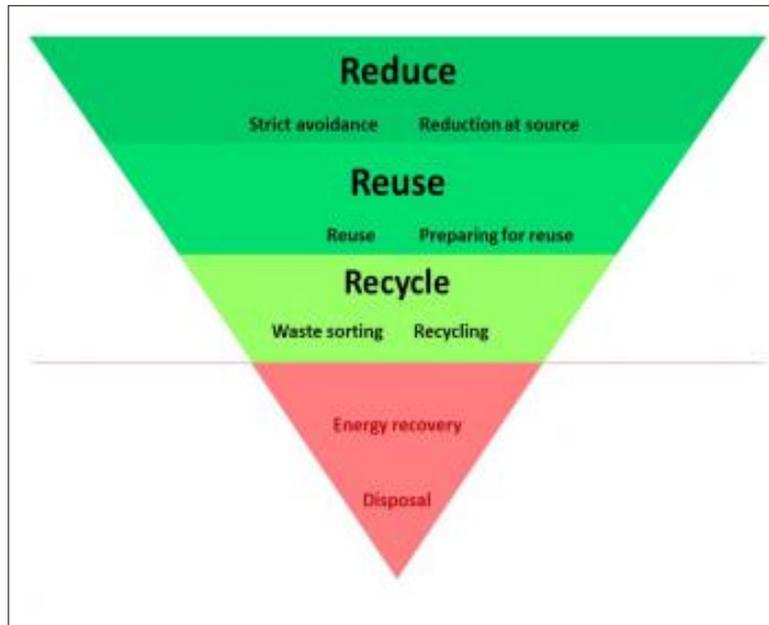


Figure 2. Action themes of EWWR (Source: <http://www.ewwr.eu/>).

To raise awareness about waste management: reduction amount of waste, reuse of waste, recycle of waste and related European Union and Member States waste policies.

To highlight the work accomplished by EWWR participants.

To provide specific training and communication tools parties involved in EWWR.

To assess the impact that they have had the communication actions in changing their patterns about consumption and waste management.

The EWWR's main characteristics are:

- development and testing of the concept of a European Clean-Up Day: „Let's Clean Up Europe“;
- coordination of awareness-raising actions during one week of the year;
- development of target group specific communication tools: private companies, schools, public authorities, public associations, citizens;
- development and promotion of Prevention Thematic Days focusing on one specific waste prevention topic per year: reuse of waste (action took place in 2013), no food waste (action took place in 2014), reduce amount of waste (action will take place in 2015), prevention of hazardous waste production (action will take place in 2016);
- the results of this initiative were immediate: in 2011, EWWR actions have involved 32 countries, in 2012, in the week EWWR, there were 10,793 actions on waste, in 2012 there were 35 coordinators involved in EWWR.

General Directorate of the environment of the European Commission has launched in the autumn of 2011 European campaign Generation Awake. The campaign was to encourage the conduct of efficient use of natural resources and by default to consume fewer such resources, to generate less waste, to save money. Thus every citizen can contribute to reducing environmental impact and hence reduce environmental and human health risks resulting in a sustainable future.

The initiative An efficient Europe in terms of resource use in the Europe 2020 Strategy aims to reduce the amount of waste and emissions of greenhouse gases by decoupling economic growth from increased consumption of energy and resources.

Another goal is to increase energy security and increase efficiency and competitiveness through innovation.

By Directive 2009/125/EC (Directive on Ecodesign) the EU has adopted measures which require producers to consider all environmental aspects throughout the road traveled by a product, from design to disposal (about 80% of the environmental impacts related products derived from the design phase and labeling). It also requires to focus on a reduced energy consumption and water, low-emission, the efficient use of materials and recycling. For that modern society to become one sustainable it is necessary that products which causes the lowest risks for the environment and human health be promoted and accepted as standard. One of the instruments which are important for political achievement of the objectives of The plan 2011 for energy efficiency and Energy 2020 is requirement for eco-design. This is important for strategy An efficient Europe in terms of resource use - flagship initiative.

Ecolabel regulates a wide range of products and services (electrical and electronics, paper products, clothing, household goods, home and garden, accommodation, etc). This label provides consumers with information about the environmental performance of the product or service (apparently up to 20% of current products would meet the criteria of the EU ecolabel). Consumers play a key role in the development of environmentally friendly products, but although awareness and awareness of the consequences of human activities on NC increased, consumers still prefer buying cheaper products and services because it is difficult to report the consumption patterns to global environmental problems (pollution, climate change, biodiversity loss, etc.) and human health issues. For this reason companies are not encouraged to produce services and products more friendly to the environment.

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