



ENCOURAGE

Erasmus+ project

Development of Courses for Sustainable Waste Management for Municipalities

[ENCOURAGE]

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**Competence profile for Waste management
specialist with the use of NQF/EQF levels**

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INTRODUCTION

EU countries are facing the problem of practical skills for sustainable implementation of Waste Management as well as the lack of knowledge on how to implement the requirements of the established legislation. Among the problems that municipalities face is the lack of sufficient education of its staff, in order to understand the economic, social and environmental benefits of reuse and recycling and the existing solutions. International consortium composed of EU-VET organizations from:

Poland – Contentplus Sp. z o.o. and Stowarzyszenie na Rzecz Innowacji i Edukacji,

Cyprus - EDITC,

Greece - Creative Thinking Development,

North Macedonia - Institute for research in environment, civil engineering and energy,

Slovenia - Znanstveno raziskovalno središče Bistra Ptuj,

developed within the Erasmus+ project, titled “Development of Courses for Sustainable Waste Management for Municipalities” [ENCOURAGE, Project Number 2021-1-PL01-KA220-VET-000030417] a set of the Courses for Sustainable Waste Management for Municipalities as well as for VET education.

According to the research in the partner's countries, there is missing or there is insufficient Waste Management educational programs integrated and offered to municipalities and public companies in the partners’ countries which would allow employees to acquire the needed competencies and increase their productivity while enabling sustainability for their local community.

In the field of waste management there is an urgent call for an urgent reaction, to build up capacities and match both short-term and long term needs for waste management experts. The ENCOURAGE project will help to change their attitude, embrace the concept of waste management and act as influencers for the encouragement of other members of their communities.

One of the most important priorities of this project is to encourage and educate the municipal employees how to manage wastes appropriately, in order to enable proper management of wastes generated within the municipalities. This will be made possible by building relevant and high-quality skills and competences through the development and implementation of Courses for Sustainable Waste Management for Municipalities. These courses will support the setting up and will provide access to upskilling pathways on sustainable waste management, which is the most relevant priority of the Project. Building an innovative, resource efficient and diversified economy requires using the potential of the regions for the

development of new economic specializations; growth of innovation and digitization of the economy; creation of conditions for maintaining and creating stable workplaces; increasing the use of information and communication technologies in enterprises and in the public sector the use of existing industrial specialization for the creation of innovative products; development of entrepreneurship; implementation of a closed loop economy. Therefore, the developed within the project e-training materials will provide opportunities for using innovative learning methods, as well as possibility to have e-courses.

The most important is to provide unique support across EU to students, entrepreneurs and innovators dedicated to developing innovative solutions to societal challenges. Due to the ENCOURAGE development, there will be the promotion of the VET sector, including dual education system and cooperation between vocational education and training institutions and employers. In practice, both VET providers and the VET institutions will have a solid basis for organizing education, acquiring and training teachers and making investments in the infrastructure of practical VET training.

The implementation of developed courses for sustainable waste management will provide recognition of knowledge and skills for appropriate handling with all waste types by the participants. In the frame of the project, there was developed the **Competence profile for Waste Management Specialist with the use of NQF/EQF levels**. The profile was based on the researchers conducted in each partner's country.

The profile aims to provide basic elements and recommendations for development of sectoral qualification descriptors for the profile Waste management specialist. The profile objectives are oriented on the increasing transparency and recognition of skills and qualifications to facilitate learning, employability and mobility on the European dimension.

During the development of this result, there were developed research questionnaires or the employees, employers of the Waste Managers, VET schools, in training institutions and local municipalities, enterprises involved in waste economy in Cyprus, Greece, Macedonia, Poland and Slovenia in order to identify the requirements for the competence profile/standard in accordance with a unified methodology which leads to the development of the profile/standard of professional competence for the Waste Management specialist along with a catalogue of learning objectives. The base for the development of the vocational **competence profile** for the Waste Management Specialist was the desk research of the National Qualifications profiles and standards in the partners' countries, as well as strategic documents and other relevant legislation.

In total, the partnership gathered more than 100 responses as the feedback from online surveys prepared in 5 languages and conducted more than 50 face-to face interviews with respondents.

Developed competence profile for the Waste Management was a tool for designing training, based on identified competences gaps and also it was the reference point for the creation of the credible and alternative source of acquiring and confirming skills.

I. WASTE MANAGEMENT IN MUNICIPALITIES

1.1. Waste Management in Municipalities in Poland

Waste management in Poland has been regulated by a number of acts and executive regulations.

As Poland is still adapting its law to the standards of the European Union, the dynamics of these changes significantly hinders the functioning of entrepreneurs on the market.

I. The legal bases for waste management are the following:

1. EU legal basis introducing significant changes in waste management in municipalities in 2013 in Poland:

- DIRECTIVE 2008/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 November 2008 on waste and repealing certain Directives; OJ L 312, 22.11.2008
- Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste; OJ L 182, 16.7.1999,

2. Legal basis for waste management in municipalities in Poland:

- Act of 14 December 2012 on waste (Journal of Laws 2022, item 699)
- Act of 13 September 1996 on maintaining cleanliness and order in communes (i.e. Journal of Laws 2022, item 1297)
- **The most important provisions of the Act of 13 September 1996 on maintaining cleanliness and order in municipalities (i.e. Journal of Laws 2022, item 1297):**

On 1 July 2013, a new waste management system was introduced in Poland for municipalities with the aim of:

- ✓ sealing the municipal waste management system,
- ✓ selective collection of municipal waste (raw materials) "at source",
- ✓ reducing the amount of municipal waste, including biodegradable waste, directed to landfill,
- ✓ increasing the number of modern waste recovery facilities,
- ✓ elimination of illegal - "wild" dumping grounds, reduction of environmental pollution with waste,



- ✓ reduction of hazards connected with transport of waste from places of its generation to places of recovery/disposal through establishment of waste management regions.
- The Act specifies:
 - ✓ the tasks of the municipality and the obligations of property owners concerning maintenance of cleanliness and orderliness,
 - ✓ the conditions for carrying out the activity of collecting municipal waste from property owners and managing such waste,
 - ✓ the conditions for granting permits to entities providing services within the scope regulated by the Act,
 - ✓ obligations of municipal waste producers in terms of selective collection of such waste.
- Tasks of the municipality:
 - ✓ ensuring cleanliness and orderliness in its territory and creating the conditions necessary for their maintenance,
 - ✓ organizing, managing and controlling the waste management system on its territory,
 - ✓ ensuring selective collection of municipal waste including at least: paper, metals, plastics, glass, multi-material packaging waste and bio-waste,
 - ✓ creating points for selective collection of municipal waste in a way that allows easy access to all residents of the municipality,
 - ✓ creation and maintenance of points for repair and reuse of non-waste products or parts of products,
 - ✓ conducting information and educational activities in the field of proper municipal waste management, in particular in the field of selective collection of municipal waste,
 - ✓ providing on the website of the commune office and in a customary manner information on entities collecting municipal waste, points of selective collection of municipal waste, the level of storage of municipal waste and waste from municipal waste processing, collecting waste electrical and electronic from households, addresses of collection points for foil, string and tire waste, generated on farms or processing plants for such waste,
 - ✓ preparation of the annual analysis of the state of municipal waste management,
 - ✓ maintaining cleanliness and order at public transport stops,
 - ✓ defining requirements for people keeping pets in terms of safety and cleanliness in public places,
 - ✓ prevention of animal homelessness,
 - ✓ ensuring the collection, transport and disposal of carcasses of homeless animals or their parts,
 - ✓ marking the area affected or at risk of an infectious animal disease.
- The municipality is responsible for achieving certain levels of preparation for reuse and recycling of municipal waste (e.g. in 2022 - the level is at least 25% by weight, and in 2035 - 65%) and levels of reduction of biodegradable waste sent to landfill.



- The municipal council, after consultation with the state district sanitary inspector, adopts regulations for maintaining cleanliness and order in the municipality. The regulations are an act of local law, which defines of municipal waste collection and order in the commune, including the basic rules for collecting municipal waste, e.g. such as: what containers to equip the property with, the frequency of waste collection. The by-laws should be adjusted to the provincial waste management plan within 6 months from the date of its adoption.
- Producers of municipal waste are obliged to selective collection the municipal waste which they produce in accordance with the requirements set out in the regulations.

- Obligations of property owners:
 - ✓ to equip the property with bags or containers, intended for the collection of municipal waste, to maintain these containers in a proper sanitary, orderly and technical condition and to keep the waste collection sites in a proper sanitary and orderly condition,
 - ✓ connecting the property to the existing sewage system,
 - ✓ selective collection of municipal waste generated on the property in accordance with the requirements set out in the bylaws,
 - ✓ to collect of liquid waste in septic tanks,
 - ✓ to dispose of municipal waste and liquid waste collected on the property in a manner compliant with the regulations,
 - ✓ cleaning the mud, snow, ice and other debris from pavements located along the property,
 - ✓ fulfilment of other obligations set out in the regulations.

- Municipalities are obliged to organise the collection of municipal waste from owners of properties where residents reside.

- The establishment of a communal waste management system also requires the establishment of resolutions:
 - ✓ the method of determining the fee for municipal waste management as well as the rate of such fee and the fee rate per container of a specified capacity,
 - ✓ deadlines, frequency and mode of payment of the fee for waste management,
 - ✓ model declaration on the amount of the waste management fee, submitted by property owners,
 - ✓ on the method and scope of providing services in the field of collecting municipal waste from property owners and managing this waste, in return for the fee paid by the property owner for municipal waste management.

- The municipal council decides on the establishment of an effective waste management system. By means of resolutions, the principles of organisation and financing of the municipal waste collection and management system are adopted.

The fee includes i.a. costs:

- ✓ Transport collection, transport, collection of waste, recovery and disposal of municipal waste,
 - ✓ setting up and maintaining selective collection points for municipal waste,
 - ✓ administrative service of the system,
 - ✓ environmental education in the field of proper waste handling,
 - ✓ it may also cover the costs of equipping the property with containers or bags for municipal waste collection and the costs of maintaining the containers in a proper sanitary, orderly and technical condition.
- Determination of waste management fees is made by way of a resolution of the municipal council and includes:
 - ✓ the method of determining the fee,
 - ✓ fee rates,
 - ✓ deadlines, frequency and mode of fee payment.
 - The act specifies the methods of determining the fee for municipal waste management. For residential properties, the fee for waste management may be the product of:
 - ✓ the number of residents residing on a given property (the most commonly used), or
 - ✓ the volume of water consumed from the property, or
 - ✓ the area of the dwelling and the fee rate.

II. Waste management education in Poland:

- Vocational education:
 - ✓ Technician of the environmental protection (code 325511). The training process of students lasts 5 years. In the profession of vocational education there is a separate qualification: CHM.05 Environmental assessment, planning and implementation of tasks in environmental protection, in which the student is prepared to perform 4 professional tasks, including, among others: 3) planning and carrying out waste management.
 - ✓ The learning outcomes relating to environmental protection are included in all occupations of vocational education (more than 200 occupations) at the level of lower secondary vocational school (I stage), technical school and upper secondary vocational school (II stage) under the learning outcome group "Occupational health and safety".
- Tertiary level:
 - ✓ The offer of Polish universities includes post-graduate studies, e.g. Environmental Management and Waste Management (Warsaw University of Life Sciences); Waste management (Warsaw School of Economics), Waste management (Silesian University of Technology).
- Courses and training offer:
 - ✓ There is a wide range of classroom and online training and specialised courses available on waste management topics, such as:
- Waste management in practice - a compendium of current legislation,

- Current obligations of entities related to waste management 2021/2022 - BDO electronic register (Database on products and packaging and waste management), waste records and reporting,
 - ADR regulations in storage, transport and waste management (*ADR - fr. L' Accord européen relatif au transport international des marchandises Dangereuses par Route*)
 - Landfill Manager and Incinerator and Co-Incinerator Manager. A 2-day training course to prepare for the state examination in waste management,
 - BDO register and waste management for beginners,
 - Medical waste in 2022. Medical waste management in light of new legislation.
- Professional development of employees is also organized in the form of on-the-job training (e.g. at the time of employment and in the case of retraining) in local government units and companies related to waste management.

1.2. Waste Management in Municipalities in Cyprus

Legislation

According to the Department of Environment, the Cypriot policy on waste management is based mainly on waste hierarchy (prevention, reuse, recycling, recovery, disposal) and the correct environmental handling. The ultimate aim is to protect the environment and human health.

This is achieved through the reduction/elimination of the negative effects of the generation and management of waste, the promotion of reuse, recycling and recovery and generally the environmentally sound management in order to reduce the disposal in landfills and to reduce the overall impact of the use of resources by improving the efficiency and effectiveness of their use.

The application of environmentally rational management of waste generated in Cyprus is achieved through the implementation of the *Waste Law of 2011 (L.185(I)/2011)* and the *Packaging and Packaging Waste Law of 2002 (L.32(I)/2002)* and their amendments, as well as the Regulations and Decrees issued in accordance thereof. The above legislation is the result of European policy and legislation harmonized and adapted to national law.

According to this legislation, the main competent Authority for waste management is the *Ministry of Agriculture, Rural Development and Environment (MARDE)*. However, in relation to specific waste streams, including mixed municipal waste, specific roles and responsibilities are attributed to the Ministry of Interior (MoI), especially in relation to the recycling, treatment and disposal activities of these waste types.

The main responsibilities of municipalities are:

- Promoting waste hierarchy as set in the existing national waste management plan and the new regulations for the municipal waste management plan (MWMP)
- Provision of municipal waste services (as it is set in the Municipalities Law and the Communities Law)

- Development, implementation and operation of systems for separate collection of paper, metals, plastics and glass – Reaching of recovery / recycling targets (as set in the new regulations for the municipal waste management plan (MWMP) – still under approval)
- Development, implementation and operation of systems separate collection organic waste (as set in the new regulations for the municipal waste management plan (MWMP) –
- The District Councils for the operation of waste disposal and utilization sites are responsible for the operation of municipal waste management facilities within their territory (district)
- Reporting to MARDE (as set in the new regulations for the municipal waste management plan (MWMP))

Municipal Waste Management Plan

In accordance with article 28 of Directive 2008/98/EC (corresponding to article 35 of L.185(I)/2011) on waste, Member States shall establish one or more waste management plans, which define the framework, directions, activities, procedures and measures for the protection of the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste, using the following hierarchy: *a) prevention, b) preparation for reuse, c) recycling, d) other type of recovery, e.g. recovery actions, and e) disposal (burial).*

In the above context the Department of Environment has developed the 2012 Management Plan for Household and Similar Type of Waste which, after public consultation (2012) and new political decisions, was changed into the **2015-2021 Municipal Waste Management Plan**. At the same time, a summary description of the Municipal Waste Management Plan entitled “Municipal Waste Management Strategy” was prepared for the period 2015-2021. The Strategy and Plan for municipal waste has been developed following wide consultation with all interested parties as well as consultation with the European Commission.

It is noted that Management Plans for the remaining waste streams will follow in order for the Republic of Cyprus to fully comply with this article.

The main axes of the strategy upon which this Plan is based, are: compliance with the obligations arising from the European directives on waste management that fall under the municipal waste stream, full utilization of existing private and State waste management infrastructure, maintaining the waste management hierarchy, with emphasis on prevention and separate sorting of waste and the adoption of best practices with the lowest cost.

Within the above context, qualitative and quantitative objectives have been set. Quantitative objectives are

(a) 40% separate collection on the total rate of municipal solid waste by the year 2021, with the ultimate target of 50% until 2027 (from 20% in 2012)

(b) 50% of recyclable materials (paper, plastic, metal, glass) in municipal waste to be prepared for reuse by 2020

(c) 15% of municipal organic waste to be collected separately by 2021

(d) the amount of biodegradable waste that is promoted for burial, shall not exceed 95,000 tonnes after processing (compared to 459,940 tonnes that were sent for burial in 2011, of which only 57,000 tonnes had been processed at the Koshi Integrated Solid Waste Management (OEDA))

(e) the achievement of the objectives of the European directives on packaging waste, electrical and electronic equipment waste generated from the residential sector and other sources that are

similar in type to those of the domestic sector and waste from household batteries and accumulators.

To achieve the objectives and fulfil the obligations arising from the European Directives, it is imperative to obtain the active involvement of local authorities, the introduction of plans and programmes for the promotion of separate collection, the reduction of the volume and the recycling of municipal waste. With regard to infrastructure, it is necessary to fully utilize the Koshi and Pentakomo OEDAs, which are under construction, to exploit the infrastructure of private waste management, to complete the green point network and to create of new landfill sites in Nicosia and Paphos, where the processing and creation, where appropriate, of waste transit stations will take place pursuant to the relevant Directive.

The new **Municipal Waste Management Strategy Management Plan 2021-2027** assigns responsibility to local authorities for the management of municipal waste and regulations have been prepared which:

- require the adoption of local waste management plans and waste prevention programmes,
- the establishment of separate collection systems for the different municipal waste streams, including organic waste and
- the adoption of pay-as-you-throw (PAYT) schemes.

Future of Waste Management in Cyprus

There is definitely a distance from the targets set by EU

Cyprus produces 609 kg of municipal waste per capita per year, being far higher than the EU average of 505 kg

- Cyprus recycles approximately 16.6% of its municipal waste, compared to an EU-wide average of 47%
- 67% of all municipal waste is disposed of in landfill, more than three times higher than the European average of 23%, and well below the 10% target set for 2030.

Waste Manager profile in Cyprus

There is no official Waste Manager Profile set in Cyprus.

The Council of Ministers approved in 2012 the establishment of the CyQF and the adoption of the 8 levels of the European Qualifications Framework.

The National Committee for the Development and Establishment of a National Qualifications Framework in Cyprus, which consists of the Permanent Secretary of the Ministry of Education and Culture (President of the Committee), the Permanent Secretary of the Ministry of Labour and Social Insurance and the General Director of the Human Resource Development Authority or their representatives.

The CyQF includes the development and implementation of the procedures that relates to the Quality Assurance and the award of Qualifications. It is also the «tool» for the categorization of the qualifications according to skills, knowledge and competencies.

It operates as a reference framework, enabling the validation and comparability of qualifications and hence the mobility of workers and learners. It is an attempt to encompass the diversity of life long learning, formal, non-formal and informal learning.

The CyQF includes:

- All levels of formal public and private education
- **The System of Professional Qualifications of HRDA**
- Informal Learning
- Non-formal learning
- Life Long Learning

The Human Resources Development Authority([Σύστημα Επαγγελματικών Προσόντων \(ΣΕΠ\) \(anad.org.cy\)](http://www.anad.org.cy)) has developed the. System of Professional Qualifications. Different Professional Qualifications Standards for the following sectors:

- Tourism Industry
- Manufacturing
- Construction Industry
- Wholesale and retail trade
- Vehicle repair
- Provision of vocational training
- Communication systems and networks / computers
- Hairdresser

However no Professional Qualification has been developed for the Waste Manager.

According to an article by Indeed Team([What Does a Waste Manager Do? \(With Steps Guide and Skills\) | Indeed.com Australia](https://www.indeed.com/au/what-does-a-waste-manager-do)) a Waste Manager should be able to do the following:

- develop and implementing waste disposal procedures under set government rules
- analyse statistics concerning local waste levels, recycling and making appropriate recommendations
- propose and implement new waste disposal and recycling schemes
- monitor and handle issues with waste disposal and recycling services
- manage subordinate employees, including waste management supervisors and officers, waste or recycling collectors to ensure quality waste services
- ensure the department meets landfill diversion, waste reduction and recycling goals
- organise training for employees on safety procedures related to handling waste materials
- educate and advise businesses and neighbourhoods on waste reduction and environmental issues
- meet with councillors, contractors, residents and other stakeholders to identify waste management issues, get suggestions and provide and implement lasting solutions
- manage contracts with other waste management companies

According to the same article a Waste Manager needs to have the following skills

- **Leadership and management skills:** As a waste manager, you may lead other employees. Good leadership and management skills can ensure efficiency in processes and productivity among employees.
- **Communication and interpersonal skills:** Good communication and interpersonal skills are essential as you meet and communicate with contractors, government officials and the public.
- **Technical skills:** Good information technology (IT) and office skills can help you perform the work more effectively.

- **Analytical skills:** These skills are vital in analysing statistics and identifying trends in waste management.
- **Time management skills:** You can use time management skills to manage your time effectively and ensure waste collection and disposal gets done in time, preventing harmful effects on the environment.
- **Organisational skills:** Waste managers oversee administrative tasks, which require organising and prioritising issues and projects to meet deadlines
- **Patience:** A waste manager handles employees' issues and complaints from businesses, contracts and the public.
- **Flexibility:** A waste manager's work may involve working beyond regular hours, holding many meetings and travelling to sites.
- **Teamwork skills:** Waste management involves working with teams and other professionals to implement projects.

1.3. Waste Management in Municipalities in Greece

INTRODUCTION

The production of MSW (Municipal Solid Waste) in urban centers is constantly increasing, posing a huge problem for governments, ministries, agencies and all agencies involved in integrated management around the world. Today, all waste, and in particular the MSW, must be treated, no longer as waste, which we must necessarily dispose of, but as a source of their recovery, reuse and utilization, both as raw materials and energy, which will result social, economic and environmental benefits. Suggested solutions are the prevention of their production, the recycling and reuse of municipal waste, the management of organic waste at their source, the creation of appropriate green spots, the rational planning of their integrated management, the appropriate choice mechanical equipment for maximum utilization, energy utilization (thermal, aerobic or anaerobic treatment) and incineration based on their energy efficiency ($> 0.65\%$ for new plants). It will emphasize the need to prevent waste generation at its source, recover and reuse its raw materials with smarter, more cost-effective and efficient solutions, recycling and any use of waste or waste (e.g. energy recovery) and finally rational disposal, in accordance with European and world laws, rules and conventions established to achieve these objectives. Each municipality has positive efforts, which, if combined, can serve as future pilot projects for any other municipality that wishes to implement a corresponding ESA management policy to reduce energy consumption.

CURRENT LEGISLATION

According to Article 12 of Law 1650/1986, local authorities are responsible for the management of solid waste, except in cases of waste which, due to its composition, type, quality and quantity, cannot be disposed of together with MSW. For the management of the latter obligated are either their producers or third parties to whom the relevant responsibility is delegated in accordance with the legal conditions. The holder of the solid waste shall deliver it to the person responsible for management, as the case may be. In particular, regarding the responsibilities of Municipalities (local authorities of the first degree of self-government) in integrated waste management, the general framework is defined in article 75 of Law 3463/2006 (Code of Municipalities and Communities), as amended and currently in force. More specifically,

according to the said Article 75, municipalities must, inter alia, ensure the collection and management of solid, in particular, waste generated within their administrative boundaries, at the level of temporary storage ...

The management of Municipal Solid Waste in Greece 42 of their administrative boundaries and for the adoption of measures in order to protect these common areas and especially the waste disposal areas from a fire outbreak. More specifically, with regard to Municipal Solid Waste (MSW), the specific responsibilities of municipalities are set out in article 228 of Law 4555/2018 and include the preparation and implementation in the administrative boundaries of the relevant Municipality of the five-year local waste management plan (TSDA) for the management of municipal waste according to article 35A of Law 4042/2012, as amended by article 84 of Law 4685/2020, which is the basis of the contracts concluded by the municipality with Alternative Management Systems (AMS) and other waste management bodies, is updated annually and must be in accordance with the relevant PECA. Based on article 6A of Law 2339/2001, as added by article 6 of Law 4496/2017, local authorities have the obligation sorting at source in appropriate recycling, recovery or disposal infrastructures, the elimination of the phenomenon of uncontrolled disposal of MSW in the environment and the restoration of any existing landfills within their administrative boundaries, the information and awareness of citizens and businesses for the integrated management of waste, the preparation of projects and actions of the TSDA for the treatment of those produced within the administrative boundaries of the MSW and the submission of a proposal for funding from European or other programs in the capacity of the final beneficiary, the registration in the information system "Integrated Waste Management Information System" of the Ministry of Interior of all kinds of monitoring the progress of the implementation of waste management projects and the qualitative and quantitative targets of the PESDA. Municipalities also have the ability to proceed with the construction and operation of other infrastructure for the optimal management of MSW under the legal conditions and restrictions.

Important initiatives for improving municipal waste management

In the last decade, several initiatives and policy measures have been employed by the Greek government to divert MSW from landfill and reduce dependency on landfill. One of the direct outcomes of Law 2939/2001 'on packaging and recycling of packaging and other products - Establishment of the National Organization for Recycling of Packaging and other Products' was the establishment of the Hellenic Recovery Recycling Corporation (HERRCO) at the end of 2001, which became fully operational by 2003. Although initially covering less than 40 % of the population, mainly in urban areas, by 2011 around 75 % of the total population of Greece was covered by the HERRCO's collection mechanisms. This operation has significantly boosted the performance of recycling and material recovery, removing a share of MSW from landfill (HERRCO, 2012).

The biggest effort to coordinate waste management in Greece so far has been the Joint Ministerial Decision 50910/2727/2003 on 'measures and conditions on solid waste management - National and Regional Management Plan' in 2003, setting specific rules and targets which must be met in waste management planning at the national and regional levels (EIB, 2010).

In 2004, a series of Decrees set the rules for the managing different waste streams, including WEEE, and batteries (YPEKA, 2012).

Construction of the planned MBT plants might contribute to an increase in recycling, depending on the ability of the plants to generate recyclable waste. The draft NWMP covering the period to 2020 has a planned capacity for 2020 of 764 000 tonnes for MBT and a combined anaerobic digestion and composting capacity of 334 000 tonnes (BiPRO, 2014).

Extended producer responsibility (EPR) is an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle. In practice, EPR implies that producers take over the responsibility for collecting or taking back used goods and for sorting and treating them for eventual recycling. The responsibility can be either voluntary or through a statutory EPR scheme set up by one or several producers. Greece has EPR systems (for MSW) for batteries, WEEE and packaging.

A recent initiative concerns a pay-as-you throw scheme piloted in Elefsina municipality in 2010–2011 within a European LIFE Environment Project HEC PAYT. The pilot was realised by implementing a separate household waste (green bins) and packaging waste (blue bins) collection in an area housing 5 500 inhabitants. The collected waste was weighed and the fee was calculated according to waste bags used by each household. According to the project results, the pilot scheme did not much change citizen's behaviour in the pilot area, proved by the negligible amount of material transferred to the blue bins. A number of problems associated with technical functionality as well as citizen mistrust were also experienced during the pilot (Municipality of Elefsina, 2011).

POSSIBLE FUTURE TRENDS

Greece will need to make an exceptional effort to fulfil the WFD 50 % recycling target by 2020.

Construction of the planned MBT plants during the next few years can be expected to reduce the amounts of BMW going to landfill and might contribute to an increase in recycling, depending on the ability of the MBT plants to generate recyclable waste. The new NWMP covering the period 2014– 2020 has a planned MBT capacity of 764 000 tonnes in 2020 and a combined anaerobic digestion and composting capacity of 334 000 tonnes. The new focus in the NWMP on improving separate collection systems – including door-to-door collection in some areas – for different recyclables and biowaste can be expected to increase recycling rates. (BiPRO, 2014).

MANAGEMENT OFFICERs PROFILE

A Waste Manager should have the following

Key skills

- *Ability to communicate with, explain ideas to and motivate others*
- *Analytical skills*
- *Capacity to grasp and apply legislation*
- *Strong organisational skills*
- *Interest in and understanding of environmental and sustainability policies*
- *Decision-making skills*

- *Ability to oversee and manage processes and people:*

In more particular :

- ensuring waste management schemes are implemented effectively and legal requirements are upheld
- overseeing the transportation of waste to ensure its efficiency and prevent contamination – of air, land or water
- using national waste strategy and policy to inform plans for waste collection, disposal, minimisation and recycling
- advising the council and other relevant bodies/people on the likely impact of new legislation, policies and initiatives
- locating areas in which waste management is problematic (eg where fly tipping is frequent) and devising solutions
- talking to members of the public, the local council and housing associations to identify and overcome problems with waste management
- creating and managing budget

Most waste management officers are employed by waste collection municipalities. However, opportunities with other types of employers do come up; the main ones are:

- private firms specialising in waste management
- environmental agencies
- not-for-profit organisations working for environmental causes

Qualifications and training

A relevant degree – for example, in waste management, engineering, environmental or science – is often preferred, and they are widely offered in different universities in Greece, in both under and post graduate studies. Experience of waste management or recycling is valued for this role so, while you can enter the profession after graduating, some people move into it from another role in a WCA, waste management firm, environmental agency or not-for-profit organisation specialising in environmental causes.

1.4. Waste Management in Municipalities in Republic of North Macedonia

The Republic of North Macedonia, as a candidate country for membership in the European Union, needs to apply all European standards and best practices, as well as comply with European legislation. It is also necessary to find a sustainable way in waste management, which is an important segment of the environment. Waste management, in accordance with the

prescribed standards, will not only contribute to a better environment, but will also contribute to the protection of human health and ensure the implementation of the principles of circular economy in the country. The law regulates in detail the collection, transportation, selection, recycling of waste, as well as its treatment and utilization, which will enable the creation of an efficient regional system for waste management, which will meet and fulfill the requirements according to EU legislation.

The Republic of North Macedonia is walking the path towards a sustainable approach to waste management and the use of secondary raw materials and resources. Successes have already been achieved in terms of adopting a new legal framework for waste management, as well as establishing regional planning of waste management, more efficient waste collection, as well as establishing organizations for extended responsibility of producers.

The Waste Management Plan of the Republic of North Macedonia (2021-2031), which has been prepared in accordance with the Law on Waste Management ("Official Gazette of RNM" No. 216/21), builds on these results, but confirms that there is much more to be done. Authorized collectors serve almost the entire population throughout the territory, but unfortunately, the uncontrolled dumping of waste in illegal landfills is very common. The selection and recycling rates are very low, the information and data on the types of waste are inadequate, and the key institutions responsible for this problem have limited capacities. The Plan seeks to address all these problems and take action at a higher level to bring about more progress and better results, which would be based on a better understanding of how resources should be used, as well as to provide answers to the demands arising from European legislation.

The goal is to unblock and overcome existing problems in the current system, in the direction of developing and implementing collection and treatment systems in accordance with the waste hierarchy and to achieve environmentally safe processing and disposal, as well as a change from a linear to a circular economy, in a way that is best adapted to the conditions in RN Macedonia.

Waste Management Policy in RNM

The key principles of the European waste management policies are the basis of the strategic direction of the waste management in the RNM, starting from the waste producers, through their reuse, recycling, processing, up to the final disposal, taking into account the remaining problems with the historical waste that is the result of inadequate waste management in the past period.

Establishing a modern waste management system is a complex task, and although now is the time for integrated waste management, current measures are tailored to the needs of RNM, focusing on the early stages of development.

The basic strategic principles are clearly defined in the Waste Management Strategy, Waste Management Plan of the Republic of North Macedonia, Regional Waste Management Plans, and the programs and relevant laws that are described below.

Environment and Climate Change Strategy

The previous strategy for the environment and climate change of EU (2014-2020) defines the priority actions whose purpose is a series of benefits for the environment and society. What matters is that the strategy updates the legal framework for climate change and the environment. The strategy upgrades the legal framework of EU environment, in the direction of better preparedness for the challenges of joining the EU.

The strategy introduces the concept of sustainable development, recognizing that respect for the highest standards in the environment is at the basis of the long-term national, social and economic interests of the Republic of Macedonia, and is in support of the integration of environmental and climate change policies in all sectors.

National Waste Management Strategy

The National Waste Management Strategy (2008-2020) is the basis for the preparation and implementation of the National and Regional Waste Management Plans, which defines the basic direction for waste management. The main priorities established by the strategy are:

- Solving the problems with waste at the place where it is created
- Selection of different types of waste
- Use of waste as a replacement for non-renewable natural resources
- Integrated network of waste treatment and disposal facilities
- Infrastructure for hazardous waste management
- Rational and environmentally aware use of soils
- Closure and remediation of the existing illegal and non-standard landfills

With the National strategy for waste management, the concept of integrated waste management is introduced at the regional level. Establishing regional structures for more successful coordination of waste management activities on behalf of the member municipalities was a key recommendation of the former NWMP (2009-2015).

This plan is used for another ten years after the end of the current strategy. From there, it takes the opportunity to introduce newer concepts used in the EU for waste and resource management such as, for example, the "circular economy", which will be included in the next RNM Waste Management Strategy.

Waste Management Legislation

National waste management policies are based on the Law on the Environment (LE) and the Law on Waste Management (LWM).

The state administration body responsible for environmental matters in the Republic of North Macedonia is Ministry of Environment and Physical Planning (MoEPP).

Competent bodies of the state administration of the Republic of North Macedonia, the inter-municipal waste management boards, the municipalities and the city of Skopje, as well as the legal and physical persons who manage the waste, in accordance with the Law on Waste Management ("Official Gazette of the RSM" no.216/21), are obliged to adopt and implement strategic, planning and program documents for waste management in the territory of the Republic of North Macedonia. They aim to ensure:

- protection of the environment, human life and health,
- establishment of a sustainable system for proper collection and management of waste,
- realization of the obligations related to the waste management, which Republic of North Macedonia has taken on at the international level.

Waste Management Strategy

The strategy for waste management, which is adopted for a period of 12 years, determines:

- the general waste management policy at the national level;
- description and evaluation of the existing situation for waste management;
- national short-term and long-term goals to be achieved in the waste management process;
- performance indicators of waste management policy;
- management guidelines for all waste streams;
- measures for realization of the policy for waste management;
- criteria on the basis of which the capacity is determined, ie the location for waste processing and disposal;

- assessment of suitability of the use of economic and other instruments in dealing with the various problems with waste, for the purpose of applying the hierarchy of waste and achieving the goals in waste management;
- identifying activities and measures that will contribute to the prevention of waste generation for the purpose of reducing it, identifying appropriate specific qualitative or quantitative indicators for the success of waste prevention measures, with a clearly defined time frame for their achievement and
- activities to raise awareness and provide information aimed at the general public or target groups of consumers and other issues relevant for development of waste management.

Waste management plan of the Republic of North Macedonia

For realization of the Strategy for waste management, the Ministry of Environment and Physical Planning for a period of six years adopts a Plan for waste management of the Republic of North Macedonia, which contains:

- a description of the current situation for waste management in the Republic of North Macedonia;
- national goals to be achieved in terms of preparation for reuse, recycling, processing and disposal of waste and the timelines for their implementation;
- approaches to waste management;
- legal and institutional framework for waste management;
- obligations of state administration bodies and local self-government units, including a description of the distribution of responsibilities between public entities and physical persons that perform waste management;
- regional waste management planning and service provision;
- maintaining a waste management database;
- measures and activities for implementation of the waste management hierarchy;
- measures and activities for the implementation of extended responsibility of producers;
- measures for regulation of import, export and transit of waste;
- remediation measures for non-standard and illegal landfills and contaminated areas;
- way of managing various types of waste (municipal, commercial, industrial, construction, hazardous, medical, the special waste streams, as well as management of sludge from sewage treatment plants);
- measures and activities to establish landfills;
- waste management action plan;
- indicators for monitoring the Plan and
- the content of the programs for management of special waste streams, namely: packaging waste, waste electrical and electronic equipment, waste batteries and accumulators and other special waste streams.

Regional waste management plans

The councils of the municipalities and the council of the city of Skopje, on the proposal of the inter-municipal board for waste management (where the mayors are members or persons appointed by them), for a period of six years adopt a Regional plan for waste management for the region, which regulates and harmonize the common goals in waste management at regional level.

The regional plan in particular contains:

- planned waste management technologies and methods;

- a description of the existing waste management systems and the main disposal and processing installations, including installations for dealing with separate waste streams;
- assessment of the needs for new collection systems, closure of existing waste installations, additional infrastructure of waste installations in an integrated waste management network and, if necessary, related investments;
- measures for education and raising public awareness about waste management;
- the goals to be achieved in the waste management process in terms of preparation for reuse, recycling, processing and disposal of waste as well as the time limits for their implementation;
- measures for collection, selection, recycling, processing and removal of waste;
- assessment of the financial resources needed for the implementation of the Regional Plan, as well as economic instruments for establishment of regional waste management;
- indicators for monitoring the performance of the regional plan; and
- estimation of the number of isolated settlements and a way to include them in the waste management system.

Waste Prevention Plan

For a period of six years, the MoEPP adopts a Plan for prevention of waste generation, It describes the measures to prevent the generation of waste, as well as the ways in which their applicability is evaluated, including examples with which the prevention of waste generation is carried out, as well as other appropriate measures.

The Plan for prevention of waste generation establishes appropriate quantitative and qualitative national goals for prevention of waste generation, as well as separate indicators, on the basis of which progress in the implementation of measures for prevention of waste generation will be monitored and evaluated.

National goals for the prevention of waste generation should be determined in a way that economic development and the impact on the environment are interdependent with the amount of waste generated, whereby greater economic development should lead to greater prevention of waste generation.

Waste management programs

Entities that in performing their activity during one calendar year create more than 200 kilograms of hazardous waste or more than 100 tons of non-hazardous waste, adopt Programs for waste management. These Programs should be aligned with the guidelines given in the national documents: Strategy, Waste Management Plan, Waste Prevention Plan and Regional Plan.

Obligations of the municipalities and the city of Skopje for the management of municipal and other non-hazardous waste

The mayor of the municipalities and the mayor of the city of Skopje, in accordance with the Plan and the Regional Plan, is obliged to:

- takes care of waste generated by households, as well as other waste generated in the commercial and industrial sector, which due to its characteristics, composition and quantity is similar to waste from households (municipal waste) and from occupation and activities in the area of the municipality;
- provides conditions for selection and management of special waste streams that are part of the producer's extended responsibility system;
- takes care of public cleanliness and collection and clearing of abandoned waste;
- proposes and adopts acts that will regulate the prevention, reduction, selection, collection and transportation of municipal waste and commercial waste, as well as takes measures to implement the adopted acts;

- obligatorily cooperates with the mayors of other municipalities and/or the city of Skopje for the purpose of establishing and functioning of the regional waste management system, and in connection with the management of municipal and commercial waste;
- realizes projects and undertakes measures to improve the general situation with waste management;
- acts in accordance with the general rules for the management of municipal and other types of waste for which according to the law, the municipalities ie the city of Skopje, are responsible for management and cooperates with managers of special waste streams.

Prepared documents in accordance with the law on waste management

Waste Management Plan of Republic North Macedonia for 2021-2031

The Waste Management Plan of the Republic North Macedonia refers to the period from 2021 to 2031 and contains the following information:

- Description and assessment of the existing situation in relation to waste management;
- Predictions of future situations in relation to waste management;
- Guidelines and goals in relation to waste management, including the time schedule for their implementation;
- Realization of the measures, activities and the way to achieve the goals for dealing with the special types of waste, the time schedule and the extent of their execution;
- Incentive measures for the implementation of activities to avoid and reduce the amount of generated waste, as well as reuse, recycling and use of waste as an energy source;
- Ways to remove waste that cannot be avoided and processed;
- Determination of the type and amount of waste according to which the obligation for legal and physical persons to develop waste management programs is determined;
- Realization of the monitoring system for waste management;
- Concrete measures and activities to reduce the biodegradable ingredients in the waste intended for disposal and the time schedule and scope of their realization;
- Determining the needs of the Republic of North Macedonia for the construction of facilities and installations for processing and waste disposal, including measures and deadlines for implementation;
- Locations and installations for waste disposal;
- Data on the integrated national network for waste disposal and waste processing installations;
- Technical and other conditions that need to be fulfilled during waste management;
- Measures for remediation of illegal landfills and contaminated areas;
- Activities undertaken by the local self-government units in connection with waste management;
- Determination of the regions for waste management;
- Measures for education and for raising public awareness about waste management;
- Estimating the costs of waste processing and disposal operations and
- Financial instruments to implement the Waste Management Plan.

The framework for preparation of the second National Waste Management Plan of Republic of North Macedonia is the National Waste Management Strategy 2006-2020, as well as the existing legal regulations and the European Union legislation.

The National Strategy for Waste Management as an integral part of the National Strategy for the Environment contains an assessment of the current state of waste management, strategic

and quantitative goals and measures to achieve these goals, guidelines, assessment of investments and sources of financing.

The main task of the Plan for this period is to establish the sustainable functioning of the basic infrastructure for managing municipal waste:

1. Organization structures
2. Technical infrastructure
3. Financial structures
4. Legal framework

The Plan also contains specific information regarding the management of different waste streams.

In the period between 2021 - 2031, the focus should be directed towards the following:

1. Municipal waste

- Promoting measures to reduce waste generation;
- Reuse and recycling;
- Processing of bio-waste;
- Construction waste management;
- Raising public awareness;
- Strengthening the principle of "Extended producer responsibility" for the management of separate waste streams originating from households; and
- Involvement of the private sector in municipal waste management.

2. Other waste types

- Establishment of national systems for the management of industrial hazardous waste, medical hazardous waste, sewage sludge and waste from treatment plants;
- Strengthening the management of the special waste streams that are under the regime of extended responsibility of producers.

Waste Prevention Plan in the Republic of North Macedonia 2022-2028

The plan for prevention of waste generation of the Republic of North Macedonia for period 2022-2028 prescribes a series of regulatory, political and practical activities whose purpose is to significantly reduce the amount of produced waste.

The objectives of the Plan are:

- Reduced consumption of materials, water and energy, which cause the creation of larger amounts of waste;
- Developing systems for collection and recycling and re-use;
- Reducing the amount of residual waste that needs to be landfilled, by removing recyclable materials and organic waste from the total waste;
- Sorting residual waste to extract additional recyclable materials;
- Implementation of programs that stimulate resource efficiency and create a "circular economy";
- Supporting sustainable development and employment in the "green" economy, including the creation of new jobs;
- Reduced generation of hazardous waste;

- Reduction and management of the amount of dangerous substances in products;
- Informing and influencing evidence-based decision-making;
- Awareness raising of the importance of preventing waste generation among citizens, businesses and the public sector in order to bring positive changes in behavior.

The plan contains new measures and approaches, such as thinking about the life cycle of products, circular economy and "Zero Waste" to stimulate a fundamental change in the design of products in order to reduce the consumption of resources. To think about the impact of products on the environment, from their creation, distribution, use and usage, all the way to the end of their life cycle.

The role of Local Self-Government

The Local Self-Government should undertake the following measures and steps:

- It will change its practices and behavior in order to prevent the generation of waste at the local level;
- It will build a network of local organizations that are already active in this field, and will create working groups for the prevention of waste generation, in charge of preparation and managing the implementation of a local Plan.
- It will prepare local plans for the prevention of waste generation in line with the guidelines in the Waste Management Plan 2021-2031.
- Developing local green procurement practices when purchasing products and services at the municipal level;
- Analysis and implementation of pilot initiatives for selection and treatment of solid recyclable materials and biodegradable waste, aligned with national policies and initiatives for market development;
- Work with non-governmental organizations and other entities for support and development of opportunities for reuse, refurbishment and repair (RRR) at local level;
- Development and implementation of programs for education and informing the local population and business entities about measures to prevent waste generation;
- Strengthening and supporting local circular economy initiatives, including cooperation between businesses and the community.

Specification of Waste Manager

Waste Manager regarding legislation

A Waste Manager is a person responsible for managing and/or dealing with waste at a legal or natural person who creates, owns or deals with waste. Pursuant to Article 27 of the Law on Waste Management, legal entities and natural persons who, in the course of their activities, generate more than 200 kilograms of hazardous waste or more than 100 tons of non-hazardous waste during one calendar year adopt Waste Management Programs in accordance with the Waste Management Strategy, the Waste Management Plan, the Plan for the prevention of waste management and Regional Waste Management Plans. Pursuant to Article 48 of the Law on Waste Management the above-mentioned legal entities and natural persons are obliged to appoint at least one professionally trained person - Waste Manager that possess authorization for Waste Management.

According to Article 48:

The Waste Manager performs the following activities:

- prepares and implements the annual program of legal entities and individuals;
- monitors the current situation in waste management;

- undertakes activities and measures for the reduction and removal of the generated waste;
- takes care of the implementation and application of waste management procedures in accordance with the Law on Waste Management or another regulation;
- keeps records and prepares reports and implements obligations in accordance with Article 50 of this law and waste management regulations;
- prepares reports on major accidents or breakdowns that may occur during waste management;
- controls the generation of waste in technological processes;
- informs the responsible authorities and responsible person in a legal entity about the possible threat to the environment, life and health of people as a result of the production, treatment, processing and disposal of waste and proposes specific solutions; and
- controls the type and quantity of waste that is generated, processed and disposed of, and the type and quantity of secondary raw material.

As previously mentioned, the Waste Manager should be authorized for Waste Management, i.e. the Waste Manager should gain a Certificate of passing the professional exam for performing the tasks for waste management and/or waste handling from the Ministry of Environment and Physical Planning (MoEPP). In order to acquire this Certificate of professional qualification, first it is necessary to complete training in waste management and/or waste handling, which is carried out and issued by an authorized legal entity from MoEPP.

Waste manager according to systematization in the municipal administration

This chapter contains information on the systematization of jobs that include waste management, according to the Regulations on the systematization of jobs of the municipal administration.

1.5. Waste Management in Municipalities in Slovenia

Introduction

According to Slovenian legislation Waste is a material or object which is thrown, intent or must be thrown away. Basic division is among ***communal/municipal, industrial, construction and mining waste***. As waste is Environmental problem, society strive to limit their influence on Ecology of living earth system. Secondly, society take care about use of limited resources and encourage recycling and sustainable approach to any material production.

On average, Slovenia generates a little more than ***8 million tons of waste per year, of which more than one million tons is municipal, which amounts to 495 kilograms per inhabitant***. In the past most of waste was landfilled, now legislation and investments turn trends toward a positive way. With a very high rate of municipal waste recycling of 59 percent, Slovenia ranks among the top in Europe.

Promoting sustainable management of natural resources and efficient use thereof, especially by ***supporting the transition to a circular economy***, are key aspects of waste management. Both waste prevention and preparation for reuse and recycling make it possible to manufacture products from resources that have already been used, which greatly reduces the burden on natural resources.

Slovenia uses environmental principle, the "*polluter pays principle*", stipulates that the polluter covers all the costs of the prescribed measures for the prevention and reduction of pollution and environmental risk, the use of the environment, and the elimination of the consequences of the environmental burden, including the costs of implementing preventive and remedial measures in the case of environmental damage.

For the purposes of waste prevention, reuse of products and the preparation for reuse, recycling and other types of waste recovery after the end-of-life of certain products, *extended producer responsibility is stipulated for producers of products*. This determines the producer's obligations throughout the product life-cycle, though users are most familiar with the obligations on products' end-of-life. Waste management under extended producer responsibility is currently in force for the following mass waste streams: packaging, electrical and electronic equipment, portable batteries and accumulators, candles for graves, plant protection products containing hazardous substances, medicinal drugs, and end-of life tyres and vehicles.

SLOVENIAN - NATIONAL MODEL /APPROACH TO WASTE MANAGEMENT

OVERVIEW OF SLOVENIAN APPROACH TO LEGISLATION AND WASTE MANAGEMENT

Any polluter or actor operate in a field of waste are obliged to work according to following national rules. As rules provides also *Compulsory public services at local level* involved *actors need to respect this way of organization and waste management directions*. People involved in "Waste management" in Slovenija are faced with the waste management practice and legislation behind. Oppositely, Waste management is fully determined and based on NATIONAL WASTE LEGISLATION, DIRECTIVES AND POLITICS. Issues follow determine the content of waste management

1. First document

Resolution on the National Environmental Action Programme 2020–2030 provides long-term guidelines, goals and tasks in environmental protection (GOV.SI).

2. Second document

Report on the environment in the Republic of Slovenia 2022 (GOV.SI).

Professional monography contain report on the situation in the environment in the country in last year. Data guide society toward measures and action need for the improvement of the current status.

3. Third group of documents – basic legislation

Currently operational legislation: THE LAW ON ENVIRONMENTAL PROTECTION (ZVO-2) in power from 13.04.2022. The main focus of the legislation can be summarized as follow:

By this law country regulates the protection of the environment from pollution as a fundamental condition for sustainable development and, in this context, defines the fundamental principles of environmental protection, environmental protection measures, monitoring of the state of the environment and information about the environment, economic and financial instruments of

environmental protection, public services of environmental protection and others with protection environment related issues.

4. *Fourth - DIRECTIVES - General waste management rules*

Directive aim to support the protection of the environment and protection of the human health, determines the rules of conduct and other conditions for preventing or reducing the harmful effects of waste generation and handling, as well as reducing the overall impact of the use of natural resources and improving the efficiency of the use of natural resources in accordance with EU Directive 2008/98/EC of the European Parliament and the Council of 19 November 2008 on waste.

5. *Fifth - Processing or cross-border shipments of waste*

Several documents regulate all cross border transports and shipments of any waste material.

6. *Sixth - Handling of individual types of waste materials*

With 14 directives legislation regulate and control all types of handling/management of waste materials.

7. *Seventh - Compulsory public services at local level*

Four directives regulate which public services need to be provided by municipalities as basic organization level of the local community.

8. *Eight - Extended producer (or supplier) responsibility*

Nine directives regulate Extended producer responsibility in all fields of production or trade.

9. *Nineth – Taxes for environmental pollution*

Five Directives regulate taxes need to be paid by polluters.

WASTE MANAGEMENT QUALIFICATION PROFILE

For greater job satisfaction and career success, managers should align with the organization's vision, mission, strategies, leadership, systems, structure, and cultures. Managers should embrace the organization's ethics and core values as well as their own.

Functions of management

In general manager should be able to operate and perform according to five basic activities.

At the most fundamental level, management is a discipline that consists of a set of **five general functions: planning, organizing, staffing, leading and controlling**. These five functions are part of a body of practices and theories on how to be a successful manager.

Understanding the functions will help managers focus efforts on activities that gain results:



1. **Planning:** When you think of planning in a management role, think about it as the process of choosing appropriate goals and actions to pursue and then determining what strategies to use, what actions to take, and deciding what resources are needed to achieve the goals.
2. **Organizing:** This process of establishing worker relationships allows workers to work together to achieve their organizational goals.
3. **Leading:** This function involves articulating a vision, energizing employees, inspiring and motivating people using vision, influence, persuasion, and effective communication skills.
4. **Staffing:** Recruiting and selecting employees for positions within the company (within teams and departments).
5. **Controlling:** Evaluate how well you are achieving your goals, improving performance, taking actions. Put processes in place to help you establish standards, so you can measure, compare, and make decisions.

Roles of Managers within the Organization

Organizational structure is important for management to succeed in any organization, which always has a structure. No matter the organizationally specific title, organizations contain front-line, middle, and top managers. The more you move toward the top of the pyramid, the fewer managers you have. All of these management roles have specific tasks and duties. A managerial role is the set of functions a manager is expected to perform because of their position in an organization.

A manager plays an essential role as a responsible person. Some thoughts point out that **managers perform three leading roles: decisional, interpersonal, and informational.** In the decisional role, managers can act in an entrepreneurial manner as a disturbance handler, resource allocator or negotiator. Managers may be figureheads, leaders, and liaisons in interpersonal positions. In the informational role, they monitor, are disseminators or spokespersons, and share information.

Effective Management of Organizational Resources

An essential component of operationalizing the organization's strategic plan is allocating resources -the most important thing to do.

Resources can be defined as people, time, money, and assets — and of course, the basic definition of a project is to have a goal and a start and end date.

Managers **participate in operational planning and budget planning processes** and, in doing so, **actively determine what should be done**, in what order it is to be done, and determine what resources are appropriate to be successful in achieving the plan.

Keep in mind that management is not a personality contest. The strategic plan and its specific objectives determine what is important and may be less important.

Understanding and Applying the Emotional Intelligence (EQ) in Maximizing Human Potential

Effective managers understand the context and culture in leadership situations. What helps these managers succeed? It is simple; they understand EQ (the competencies in each dimension of emotional intelligence).

Those four dimensions are:

- high self-awareness,
- social awareness,
- self-management, and
- good social skills.

All of these competencies are important, and they lead to great connections with people. They lead to stronger and more effective managerial performance. EQ is a very important component for excelling as a supervisor.

The job of the manager is to find a way to turn a team member's skill and talent into a higher level of performance. This idea does not suggest manipulation at all. Instead, it is about maximizing human potential, one team member at a time. It is as much art as it is science.

Know the Business

A common axiom in management is that a qualified manager can manage any business. This point is only partially true. Most managers are indeed generalists rather than specialists.

However, in the case of WASTE MANAGEMENT, knowing the business is essential. Because of this, managers should know and be aware of the waste system in the country; consequently, at the beginning is important to know in detail a complete legal system of waste management in the country.

Manager aspirants must learn the characteristics of the business in the process of learning by doing, working and leading operational business and implementing essential managerial elements.

References:

GOV.SI Env. and Spatial Planning; see English and also Slovenian version in a case of directives; <https://www.gov.si/en/policies/environment-and-spatial-planning/environment/waste/>

WM officer; <https://www.prospects.ac.uk/job-profiles/waste-management-officer>

II. Competence profile for the Waste Management Specialist

1. JOB DESCRIPTION

1.1. Synthesis of the profession

A waste management specialist is an employee of an institution dealing with broadly understood environmental protection or a company generating large quantities of environmentally harmful waste, responsible for developing methods of elimination and disposal of waste and carrying out a number of formalities related to this process.

1.2. Description of the work and how it is performed

Job description

A municipal/enterprise waste management specialist is responsible for conducting, planning and controlling waste management at the place of its generation. He/she promotes the principles of proper waste handling, including waste recovery in installations.

In the case of a person employed in the authority office, the specialist deals with issuing permits for waste generation, storage, processing, etc., as well as issuing decisions on a number of other processes covered by the **Environmental Protection Act** and other legal acts regulating the above issues.

A waste management specialist deals with activities consisting in planning and supervising waste management in municipalities/companies in order to reduce their negative impact on the environment.

He/she carries out work related to waste turnover. He/she initiates activities in the field of waste prevention and preparation for reuse.

Working methods

The work of a waste management specialist in municipalities/companies may be of an office based, in which case he or she draws up plans, cost estimates, templates of documents, reports and provides for the need to obtain permits required in waste turnover/handling. He/she can also realise himself/herself as a technologist planning the process of collecting, processing, recovering and collection of waste.

He/she may also implement organisational and technological solutions for waste management in the municipality/company and supervise their implementation - in which case his/her organisational skills, responsibility and other social competences determining the effectiveness of working with people become important. Sometimes there will be a need to demonstrate how

to perform waste separation and sorting - then he/she should be able to do physical work, but this is not the main purpose of his/her professional activity.

IMPORTANT:

A municipal/enterprise waste management specialist performs his/her work in accordance with current legislation. Therefore, he/she should update his/her knowledge in this field up to date. He/she may also carry out his/her own business activities aimed at the handling of various types of hazardous and non-hazardous waste.

1.3 Work environment (work conditions, machines and work tools, hazards, work organization)

Working conditions

A waste management specialist performs a number of administrative tasks, which vary depending on the place of employment.

The work of a waste management specialist in municipalities / enterprises can be carried out in offices, laboratories, production halls and outdoors.

Opportunities to work in the profession

Employment opportunities are created, as mentioned earlier, by public institutions dealing with broadly understood environmental protection, as well as private companies and production or industrial enterprises that generate significant amounts of environmentally harmful waste.

A waste management specialist can work:

- ✓ administrative, research, scientific and other units,
- ✓ in municipal service companies,
- ✓ in regional municipal waste processing installations,
- ✓ in raw material processing plants,
- ✓ extraction companies,
- ✓ service and production plants.

Work organisation

A waste management specialist, depending on the place of work, professional tasks performed and the number of people employed in the company, can work individually or in a team waste management specialist usually works in one or two shifts, with fixed working hours.

It is particularly important to plan and organize waste management in accordance with:

- sanitary and hygienic requirements,
- principles and regulations of occupational health and safety,

- fire rules and regulations,
- principles and regulations of environmental protection,
- principles of waste management and internal procedures.

Hazards affecting human occupational safety

A waste management specialist may be exposed to the following hazards:

- chemical or bacteriological (waste components that can cause, for example, poisoning),
- mechanical (handling, rolling, lifting waste containers, transferring, turning waste, cleaning waste tanks, operating machinery and equipment).

Diseases that occur in the profession include:

- acute or chronic poisoning,
- severe allergic reactions
- skin diseases,
- eye diseases,
- infectious diseases.

1.4 Psycho-physical and health requirements

Psycho-physical requirements

For an employee performing the profession of a waste management specialist, it is important:

- in the category of physical requirements:
 - visual efficiency
 - hearing efficiency
 - ability to perform physical effort
 - efficiency of the respiratory system;
- in the sensorimotor skills category:
 - eye-hand coordination,
 - dexterity of hands and fingers,
 - distinguishing colors,
 - smell,
 - tactile sensitivity,
 - quick reflexes,
 - sense of balance,
 - perceptiveness,
 - hand dexterity,

- finger dexterity,
- no fear of heights;

- in the category of skills and abilities:
 - concentration and divisibility of attention,
 - ease of switching from one activity to another,
 - readiness to work in unpleasant environmental conditions,
 - spatial imagination,
 - accounting skills,
 - technical skills,
 - managerial and organizational skills,
 - ease of expressing oneself orally and/or in writing,
 - the ability to make quick and accurate decisions,
 - ability to motivate co-workers,
 - ability to analyze and systematize complex problems,
 - the ability to analyze the situation and take risks,
 - ability to comply with rules, regulations and standards,
 - the ability to make contact with people,
 - cooperation and cooperation in a team (group),
 - the ability to negotiate effectively,
 - ability to resolve conflicts,
 - the ability to maintain positive relationships with colleagues,
 - predispositions to deal with people;

- in the category of personality traits
 - reliability and accuracy,
 - willingness to work in a fast-paced environment,
 - high self-discipline,
 - good organization of own work and the supervised team's work,
 - willingness to work in unpleasant (different) environmental conditions,
 - ability to establish contacts,
 - ability to cooperate,
 - willingness to present the results of your work,
 - communication skills,
 - self-presentation,
 - efficiency and effectiveness,
 - responsibility for professional activities,
 - ecological responsibility,
 - flexibility and openness to changes,
 - independence,
 - regularity,
 - resistance to work under time pressure,
 - responsibility for others,
 - ability to deal with stress,
 - attention to quality of work,



- willingness to learn,
- taking the initiative,
- readiness for continuous learning,
- readiness to share knowledge,
- readiness to introduce changes,
- have official interests,
- have social interests,
- have managerial interests.

Health requirements

This occupation may require a high level of general physical fitness, good eyesight and hearing and a strong sense of touch. A contraindication to the profession of waste management specialist is a tendency to allergies.

IMPORTANT:

The state of health and any contraindications to the occupation are decided by an occupational physician.

1.5. Education, professional titles, qualifications and permissions necessary/preferred to work in the profession

Education necessary to work in the profession

To work in the profession of a **waste management specialist**, higher education is required, preferably in the field of environmental protection or environmental engineering (e.g. graduation in the profession of environmental protection technician or similar is preferred, specialization in waste management is recommended). Potential employers pay special attention to practical experience possessed by the candidate and acquired in a position with a similar scope of duties. In this case, knowledge of applicable legal regulations related to environmental protection and the Code of Administrative Procedure is also extremely important. Basic computer skills will also be required.

Work experience and work experience required

- recommended work experience of 4 years, including min. 1 year in administration.

Professional titles, qualifications and permissions necessary/preferred to work in the profession

Additional advantages are:

- certificates confirming participation in training in the field waste management or environmental protection,
- specialist qualifications to operate machinery and equipment used for preliminary work waste treatment,
- driving license of the appropriate category,
- powers of forklift and tractor operator, crane operator and backhoe loader,

- in the case of transporting hazardous waste, it is advisable to have additional ones qualifications (ADR - authorization to transport hazardous materials).

1.6. Possibilities of professional development, promotion and confirmation of competences

- Waste management specialist can work physically, performing tasks related to the collection, preparation of waste for recycling, disposal, storage and transport of waste.
- Waste management specialist may also work as a supervising foreman work of a team of employees.
- May hold independent positions related to waste management in the enterprise.
- Waste management specialist can continue his education in the fields of study related to environmental protection or improve skills by participating in industry-related ones trainings, conferences, as well as thematic workshops on the economy waste.

Possibilities to confirm competencies

Depending on the position on which a person in this profession may be employed, employers organize training themselves or may use the training services of commercial companies or universities.

III. PROFESSIONAL TASKS AND LEARNING OUTCOMES

3.1. Professional tasks

A waste management specialist performs a variety of tasks, including in particular the task conducting with:

1. Waste management.
2. Recycling.
3. Circular economy.
4. Profitability of effective waste management.
5. Methods of waste disposal and processing.

3.2. List of learning outcomes of additional professional qualification and verification criteria

To perform professional tasks in the field of a waste management specialist, it is necessary to achieve the following learning outcomes:

Module 1. Waste management

Learning outcomes – knowledge	Verification criteria
Student/ specialist	Student/specialist



<p>Characterize elements of waste minimization</p>	<ul style="list-style-type: none"> ✓ Define waste. ✓ Define the concept and assumptions of the concept of waste minimization (in the context of municipalities, enterprises, individuals). ✓ Characterise the product life cycle. ✓ Presents solutions enabling the use of products that can be recycled in the company's operations ✓ Describe the stages of processing paper, cotton and furniture waste into new products.
<p>Complie with waste minimization strategy</p>	<ul style="list-style-type: none"> ✓ Characterise the Cleaner Production concept and Zero Waste concept relations to the principles of minimising waste production. ✓ Plan the process of waste processing in a form that does not threaten the environment ✓ List solutions limiting the size of generated waste.
<p>Apply waste minimization processes and practices</p>	<ul style="list-style-type: none"> ✓ Present practical examples of waste minimization and present benefits of implementing waste minimisation. ✓ Characterise the assumptions of the concept of eco-design of finished products. ✓ Give examples of how individual consumers can implement waste minimisation in their daily lives.
<p>Promotion of waste minimization</p>	<ul style="list-style-type: none"> ✓ Characterise the benefits of waste minimization for enterprises and the economy. ✓ Implement solutions for promotion of waste waste minimization in municipalities, companies and also for individuals.

Module 2. Recycling

Learning outcomes – knowledge	Verification criteria
<p>Student/ specialist</p> <p>Precycling and upcycling</p>	<p>Student/specialist</p> <ul style="list-style-type: none"> ✓ Understand the meaning of precycling and upcycling. ✓ List examples of precycling and upcycling. ✓ Implement precycling and upcycling. ✓ Integrate precycling and recycling in municipality policies where possible. ✓ List examples of precycling and upcycling. ✓ Implement precycling and upcycling. ✓ Integrate precycling and recycling in municipality policies where possible. ✓ Identify other people that want to promote precycling and upcycling within the municipalities and to other companies as well. ✓ Promote the importance of precycling and upcycling within the municipalities and to the public. ✓ Develop and support information campaigns to raise awareness about precycling and upcycling.
<p>Recycling</p>	<ul style="list-style-type: none"> ✓ Understand the meaning of recycling. ✓ List examples of recycling. ✓ Explain the importance of recycling. ✓ Implement recycling. ✓ Identify the social and economic consequences of recycling.
<p>Municipal Solid Waste Management</p>	<ul style="list-style-type: none"> ✓ List different types of solid waste. ✓ Identify and discriminate among different types of solid wastes. ✓ Provide examples of different types of solid waste. ✓ Demonstrate familiarity of recycling of different types of solid wastes. ✓ Apply recycling methods for different solid waste categories.



	<ul style="list-style-type: none"> ✓ Examine what types of solid waste is recycled in municipalities.
<p>Recycling programs apart from the programmes ran by the municipalities</p>	<ul style="list-style-type: none"> ✓ Apply recycling methods that are not ran by the municipalities like for electronic equipment, batteries , light bulbs, textiles. ✓ Identify potential environmental hazards. ✓ Proceed according to the environmental management standards. ✓ Coordinate operational and operational works carried out in the municipality or enterprise/plant.
<p>Municipal Solid Waste Management</p>	<ul style="list-style-type: none"> ✓ List different types of solid waste. ✓ Identify and discriminate among different types of solid wastes. ✓ Provide examples of different types of solid waste. ✓ Demonstrate familiarity of recycling of different types of solid wastes. ✓ Apply recycling methods for different solid waste categories. ✓ Examine what types of solid waste is recycled in municipalities.

Module 3. Circular economy

<p>Understand and implement basic elements of circular economy</p>	<ul style="list-style-type: none"> ✓ Demonstrate a clear understanding of the fundamental principles of Circular Economy, including resource efficiency, waste reduction, and circular design concepts. ✓ Identify different circular economy practices that can be applied within municipal roles. ✓ Apply circular economy concepts in practical situations into municipal project. ✓ Integrate circular economy principles (9R) into existing municipal policies, plans and projects to foster sustainable practices and resource efficiency. ✓ Collaborate with relevant stakeholders to implement circular economy initiatives effectively. ✓ Problem-solving skills and innovative thinking by developing creative solutions to improve municipal processes and reduce waste. ✓ Effectively communicate circular economy principles and practices to stakeholders, promoting awareness and knowledge sharing with the municipality.
<p>Use and understand main system and tools use at implementation of CE</p>	<ul style="list-style-type: none"> ✓ Demonstrate familiarity with various systems and tools commonly used in Circular Economy implementation, such as life cycle assessment (LCA), eco-design guidelines, green public procurement ... ✓ Explain the functionality and purpose of each system and tool related to Circular Economy implementation and how they contribute to sustainable practices and resource efficiency. ✓ Integrate the use of Circular Economy systems and tools into ongoing municipal projects to enhance resource efficiency and sustainable practices in waste management. ✓ Collect relevant data using the identified systems and tools and analyse the data to make informed decisions and identify opportunities for improvement.



	<ul style="list-style-type: none"> ✓ Collaborate with stakeholders to share knowledge and best practices related to the use of Circular Economy systems and tools.
<p>Understand the role of business models at implementation of circular economy in companies</p>	<ul style="list-style-type: none"> ✓ Demonstrate an understanding of various business models that facilitate circular economy practices within companies. ✓ Explain how circular economy business models contribute to sustainable practices, waste reduction, and resource efficiency within companies. ✓ Identify ways to integrate circular economy business models into municipal strategies and initiatives to promote sustainable development. ✓ Provide examples of how circular economy business models have been successfully implemented in companies, either within the municipality or in other relevant contexts. ✓ Analyse the benefits and challenges associated with adopting circular economy business models and their implications for companies and the community. ✓ Identify key stakeholders and collaborators, both within and outside the municipality, to foster the implementation of circular economy business models in companies. ✓ Effectively communicate the role of circular economy business models to stakeholders, promoting awareness and knowledge sharing within the municipality.
<p>Understand and apply tools for measuring the impact at CE implementation</p>	<ul style="list-style-type: none"> ✓ Demonstrate an understanding of various tools and methodologies used for measuring the impact of circular economy initiatives. ✓ Identify and select the most appropriate impact measurement tools based on the specific circular economy initiatives being implemented within the municipality. ✓ Interpret the results of impact assessments and communicate the findings to relevant stakeholders, providing insights on the effectiveness of circular economy initiatives. ✓ Use the impact assessment results to inform decision-making processes and identify areas for improvement in circular economy implementation.



	<ul style="list-style-type: none"> ✓ Effectively communicate impact measurement results to colleagues and stakeholders, promoting awareness and knowledge sharing within the municipality.
<p>Understand the working cases of CE in different countries EU</p>	<ul style="list-style-type: none"> ✓ Demonstrate familiarity with successful circular economy initiatives and projects implemented in different EU countries. ✓ Explain the different circular economy models and strategies that have been employed in various EU countries to promote sustainable practices. ✓ Collaborate with colleagues and stakeholders to share knowledge and insights gained from studying circular economy cases in different EU countries. ✓ Identify and assess how circular economy practices implemented in other EU countries can be adapted to suit the unique needs and circumstances of the municipality. ✓ Effectively communicate their understanding of working cases of circular economy in different EU countries to relevant stakeholders within the municipality. ✓ Explore opportunities to integrate successful circular economy practices from other EU countries into existing municipal strategies and initiatives
<p>Got awareness regarding 9R principles of CE implementing in EU</p>	<ul style="list-style-type: none"> ✓ Demonstrate awareness of the 9R principles of circular economy, including concepts such as Reduce, Reuse, Recycle, Repair, Refurbish, Rethink, Remanufacture, Redesign, and Recover. ✓ Identify examples of how the 9R principles have been applied in circular economy projects or practices within the EU. ✓ Explore opportunities to integrate the 9R principles into existing municipal strategies and initiatives to promote circular economy practices. ✓ Effectively communicate the importance of the 9R principles to stakeholders, promoting awareness and knowledge sharing within the municipality. ✓ Assess how circular economy projects within the municipality align with the 9R principles and identify areas for improvement.



	<ul style="list-style-type: none">✓ Identify and apply best practices related to the 9R principles, considering the specific needs and challenges of the municipality.
Prepare basic plan for CE implementation and measuring	<ul style="list-style-type: none">✓ Create a basic plan outlining the steps and strategies for implementing circular economy practices in waste management within the municipalities.✓ Clearly identify the specific objectives and goals of the circular economy plan, such as waste reduction targets, resource efficiency, and sustainable practices in waste management.✓ The plan demonstrates the integration of the 9R principles of circular economy (reduce, reuse, recycle, repair, refurbish, rethink, remanufacture, redesign, and recover) as guiding principles for implementation.✓ Allocate necessary resources (e.g., budget, personnel, technology) to support the successful implementation of the circular economy plan.✓ The plan includes strategies for engaging key stakeholders, both within and outside the municipality, to support and participate in circular economy initiatives.✓ Effectively communicate the circular economy plan to relevant stakeholders and create a reporting mechanism to keep stakeholders informed of progress and achievements.✓ The circular economy plan aligns with existing municipal strategies and initiatives to ensure coherence and synergy in sustainable development efforts.

Module 4. Profitability of effective Waste Management

<p>Analyse institutional, socio-economic, and policy issues related to waste management</p>	<ul style="list-style-type: none"> ✓ Demonstrate a clear understanding of the key institutional stakeholders involved in waste management at the municipal level. ✓ Identify and analyze socio-economic factors that influence the waste generation and disposal patterns in the municipality. ✓ Evaluate existing waste management policies and regulations and their impact on waste reduction and resource recovery. ✓ Accepting and gaining innovative thinking and use applicable creative solutions to improve municipal waste management and reduce waste generation. ✓ Be able to apply critical thinking and problem-solving skills to identify and evaluate waste management and environmental health issues and solutions. ✓ Following the latest developments, trends, and innovations in the field of sustainable waste management.
<p>Recognize the need for complying with EU and international waste management standards</p>	<ul style="list-style-type: none"> ✓ Demonstrate awareness of relevant EU waste management directives and international agreements related to waste management. ✓ Explain the importance of complying with these standards to foster sustainable waste management practices and international cooperation.
<p>Determine the possibilities for circular economy to achieve sustainable waste management within the municipality</p>	<ul style="list-style-type: none"> ✓ Identify opportunities for waste prevention and material reuse within a circular economy framework. ✓ Assess the potential benefits of adopting circular economy principles in waste management, such as reduced resource consumption and greenhouse gas emissions. ✓ Explain how circular economy business models contribute to sustainable practices, waste reduction, and resource efficiency within companies. ✓ Identify ways to integrate circular economy business models into municipal strategies and initiatives to promote sustainable development. ✓ Provide examples of how circular economy business models have been successfully



	<p>implemented in companies, either within the municipality or in other relevant contexts.</p> <ul style="list-style-type: none"> ✓ Analyse the benefits and challenges associated with adopting circular economy business models and their implications for companies and the community. ✓ Identify key stakeholders and collaborators, both within and outside the municipality, to foster the implementation of circular economy business models in companies. ✓ Effectively communicate the role of circular economy business models to stakeholders, promoting awareness and knowledge sharing within the municipality.
<p>Identify waste management challenges and discuss long- and short-term solutions</p>	<ul style="list-style-type: none"> ✓ Identify common challenges faced by municipalities in waste management, such as improper waste disposal and limited recycling infrastructure. ✓ Propose both long-term and short-term solutions to address these challenges, considering factors like technological advancements and policy changes.
<p>Examine sustainable solutions towards the establishment of an Integrated waste management system</p>	<ul style="list-style-type: none"> ✓ Evaluate the concept of an Integrated Waste Management System (IWMS) and its benefits over traditional waste management approaches. ✓ Propose strategies for integrating waste prevention, collection, recycling, and disposal in a holistic and sustainable manner.
<p>Recognize the profitability of converting waste into valuable products and its environmental benefits through analyzing case studies</p>	<ul style="list-style-type: none"> ✓ Analyze case studies showcasing successful waste-to-product initiatives that demonstrate economic viability and positive environmental impacts. ✓ Assess the potential of waste valorization projects to reduce waste disposal costs and create revenue streams.
<p>Motivate creative thinking and awareness creation to change citizens' behavior towards more sustainable consumption</p>	<ul style="list-style-type: none"> ✓ Design creative awareness campaigns or initiatives to educate citizens about the importance of waste reduction and responsible consumption. ✓ Evaluate the effectiveness of such initiatives in influencing citizens' behavior towards sustainable waste management practices.
<p>Prepare a basic plan for waste management reforms oriented to reduce municipal waste, recycle properly, and protect the environment from pollution</p>	<ul style="list-style-type: none"> ✓ Assess the level of engagement and collaboration by involving various stakeholders, such as local communities, businesses, waste collectors, NGOs, and governmental agencies, in the planning and implementation process.



- ✓ Compare the waste management reforms with best practices from other regions or countries.
- ✓ Develop a basic waste management plan that includes specific strategies for waste reduction, recycling, and pollution prevention.
- ✓ Justify the chosen strategies based on their potential impact on waste generation, resource recovery, and environmental protection.
- ✓ Clearly identify the specific objectives and goals of the circular economy plan, such as waste reduction targets, resource efficiency, and sustainable practices in waste management.
- ✓ Precisely outline the distinct aims and objectives of the sustainable waste management strategy, encompassing waste reduction targets, resource efficiency, and sustainable waste management practices.

Module 5. Methods of waste disposal and processing

<p>Municipal solid waste management: current practices, opportunities and challenges</p>	<ul style="list-style-type: none"> ✓ Demonstrate a clear understanding on Sustainability, through waste management. ✓ Identify Interconnectedness between sustainability and innovation. ✓ Foster a mindset of creativity, problem-solving, and adaptability. ✓ Gasp the current waste management challenges. ✓ Outline the most recent opportunities in the effective waste management.
<p>Introduction to Municipal waste management systems</p>	<ul style="list-style-type: none"> ✓ Collect principles/basic info about the collection and processing. ✓ Analyse data and present it as a basis for decisions. ✓ Conduct an analysis of a the recent most modern methods of collection and implementation. ✓ Identify the recent methods of waste collection. ✓ Specialize in hazardous waste and their special treatments, and understand the importance of these nowadays. ✓ Identify all basics about the ways, places and methods of storage of waste. ✓ Determine the effective introduction of the trainees to the preparation of wastes for more specialized more demanding managing. ✓ Identify the implementation of the most updated processing methods.
<p>Cost efficiency of municipal solid waste collection and processing services</p>	<ul style="list-style-type: none"> ✓ Identify the technical and respective economical parameters that are necessary for the definition of the cost analysis of collection and processes, for various municipality types ✓ Define the most accurate methods of evaluation. ✓ Develop the skill to conduct a whole cost analysis -efficiency plan for a case study municipality. ✓ Adjust/extend this plan to different types of municipalities (size, demography, type of waste etc). ✓ Assess the municipality's cost plan using various evaluationmethods.
<p>Presentation of best practices of waste collections and</p>	<ul style="list-style-type: none"> ✓ Identify different methods and models collection and process of each best practice presented in

processing in various different municipalities

correlation to the characteristics of the specific municipality.

- ✓ Develop the skill to choose the right method/process depending on the municipalities characteristics and the waste.
- ✓ Classify an approximate cost analysis of implemented waste management plans.
- ✓ Search for updated best practices worldwide.

3.2. Profile of key competences for the profession

The employee should have the ability to properly perform professional tasks and predispositions for professional development. Therefore, the following key competences are required:

- Ability to operate a computer and use the Internet
- Troubleshooting
- teamwork
- Oral communication
- Influence/Leadership
- Planning and organizing work
- motor skills
- Reading comprehension and writing skills
- Math skills

Attention:

The list of key competences was developed on the basis of the list used in the International Study – Adult Competences – PIAAC (OECD) project.

4. REFERENCE TO THE SITUATION OF THE PROFESSION ON THE LABOUR MARKET AND POSSIBILITIES FOR PROFESSIONAL DEVELOPMENT

4.1. Opportunities to work in the profession

Waste management specialist can find work in various public administration units rungs:

- marshal offices,
- city and commune offices responsible for the implementation of tasks related to economy and waste on the territory of a given administrative unit,
- Provincial Inspectorates for Environmental Protection.

4.2. Possibilities of employment of people with disabilities in the profession

It is possible to employ people with disabilities in the profession of a waste management specialist.

A prerequisite is the identification of individual barriers and the adaptation of the technical and organizational conditions of the environment and the workplace to the needs of employing people:

- with slight dysfunction of the lower limbs
- with slight dysfunction of the upper limbs
- hard of hearing, deaf and deaf

IMPORTANT:

The decision to employ a person with any type of disability can only be made after individual consultation with an occupational medicine physician.

GLOSSARY OF TERMS

5.1. 5.1. Definitions related to the description of information about the profession

Concept name	Definition of the concept
Formal education	Education provided by public and private schools and other entities of the education system, universities and other entities of the higher education system as part of programs that lead to obtaining full qualifications and qualifications awarded after completing postgraduate studies (in accordance with the Act on Higher Education) or qualifications in the profession (according to educational regulations).
Non-formal education	Education and training provided under programs that do not lead to full qualifications or formal education qualifications.
Learning outcomes	Knowledge, skills and social competences acquired in the learning process (through formal education, non-formal education or through informal learning).
European Qualifications Framework (EQF)	The structure and description of qualification levels adopted in the European Union, enabling the comparison of qualifications obtained in different countries. The EQF distinguishes 8 levels of qualifications described by means of learning outcomes (knowledge, skills and competences). The EQF is a system of reference to the national qualifications framework.
Social competence	It is the ability developed in the course of learning to shape one's own development and autonomous and responsible participation in professional and social life, taking into account the ethical context of one's own conduct.

Key competences	These are the competences (combination of knowledge, skills and social competences) of social inclusion and employment needed in professional and non-professional life and to be an active citizen. For the purpose of developing information on occupations, 9 competencies were distinguished, which were selected and grouped from a set of 15 key competencies identified in the International Survey of Adult Competences - PIAAC Project conducted periodically by the OECD.
Professional competence	It is a system of knowledge, skills and social competences necessary to perform, within a separate scope of work in the profession, a set of professional tasks. Possession of one or more professional competences should enable employment in at least one position in the profession.
Qualification	Means a set of learning outcomes in terms of knowledge, skills and social competences acquired in formal education, non-formal education or through informal learning, in accordance with the requirements established for a given qualification, the achievement of which has been checked in the validation process and formally confirmed by an authorized certifying entity.
Confirmation of competencies	It is a process of checking whether the competences required for a given qualification have been achieved. Similar terms: "validation", "examination". this process leads to certification - issuing a "diploma", "certificate", "certificate" by an authorized institution.
Sensorimotor skills	These are skills related to the functioning of the sense organs (sight, hearing, taste, smell, touch) and the locomotor system (hands, precision of hand movements, legs, hand-eye coordination, etc.).
Workplace	It is a place of work in an organizational structure, e.g. a company, institution, organization, where the employee performs professional tasks on a permanent or periodic basis. To the correct one performing tasks at a given position, it is necessary to have knowledge, skills and social competences appropriate for separate professional competences in the profession.
Professional title	It is awarded to a person who has proven that they have a certain amount of knowledge and skills needed to perform a given profession. In some professional groups (technicians, doctors, craftsmen) there are statutorily decreed names and hierarchies of these titles, while in others there are no such systems. For example, professional titles obtained in schools and educational institutions are: skilled worker and technician, in craftsmanship: apprentice, journeyman, master, in physical culture: trainer, instructor, sports manager.
Skills	It is the ability acquired in the learning process to perform tasks and solve problems relevant to the field of learning or professional activity.
Professional qualifications	They mean having the right to perform professional activities (profession), access to which is limited by legal provisions providing for the need to have appropriate education, meet qualification requirements or other additional requirements.
Informal learning	Obtaining learning outcomes through various types of activities outside formal and non-formal education, including self-learning and work experience.
Validation	It means checking whether the person applying for a specific qualification, regardless of the method of learning (formal, non-formal and informal learning) of that person, has achieved a separate part or all of the learning outcomes required for this qualification.
Knowledge	It is a collection of descriptions of objects and facts, principles, theories and practices acquired in the learning process, relating to the field of learning or professional activity.

Education	Means the result of the general and specialist education process characterized by: - level of education corresponding to the level of completed school (e.g. education: primary, lower secondary, secondary, upper secondary, journeyman, post-secondary, higher (first, second and third degree), - profile of education (graduated school) or field of education (field of study or field of study and specialty of a completed university or higher vocational school).
Professional task	It is a logical section or stage of work within a profession with a clearly defined beginning and end performed at the workplace. A professional task consists of a system of professional activities related to a single goal, ending with a specific product, service or significant decision. As a result of the division of labor, each occupation differs in the tasks it consists of professional activities.
Occupation	It is a set of professional tasks separated as a result of the social division of labor, performed by individual people and requiring appropriate qualifications and competences (knowledge, skills and social competences) acquired as a result of education or practice. Practicing a profession is a source of income.
Biowaste	Green waste as well as food and kitchen waste from households, gastronomy, mass caterers, retail units.
Waste management	Waste generation and waste management (collection, transport, processing, supervision, disposal and waste turnover).
National waste management plan	It covers the scope of activities necessary to ensure integrated waste management in the country.
Waste storage	Temporary storage of waste.
Mechanical and biological processing of waste	Processes of mechanical and biological treatment of waste with possible combination into one integrated technological process aimed at recovery, including recycling, energy recovery, thermal processing or storage.
Waste turnover	Organizing the processing (i.e. recovery or disposal processes) of waste along with keeping qualitative and quantitative records of hazardous waste.
Qualitative assessment of waste	Estimation of waste properties using specific metrics.
Organoleptic assessment	Evaluation of product characteristics (raw material, goods, product) on the basis of impressions received by the senses (taste, smell, sight, touch, hearing).
Medical waste	Waste generated in connection with the provision of health services and conducting research and scientific experiments in the field of medicine.
Hazardous waste	Any substance or object, posing a threat to the health and life of people, which the holder disposes of, intends to dispose of or is obliged to dispose of.

Veterinary waste	Waste generated in connection with the examination, treatment of animals or the provision of other veterinary services.
Recovery (waste disposal)	Use of waste as secondary raw materials.
Processing	Recovery or disposal operations, including preparation prior to recovery or disposal.
Preparation for reuse	Recycling by checking, cleaning or repairing to make products or parts of products usable.
Point of Selective Collection of Municipal Waste	Collection point for selected municipal waste, including bulky waste.
Recycling	Recovery where waste is reprocessed into products, materials or substances for the original or other purposes.
Selective waste collection	The collection of a specific type of waste in order to facilitate the method of treatment covers only types of waste characterized by the same properties and the same nature.
Landfill	Building structure intended for waste storage.
Individual and collective protection measures	Individual protection measures are devices or equipment designed to be worn or held by a worker to protect against hazards. Collective protection measures are measures designed to protect a group of people against dangerous and harmful factors occurring individually or in combination in the work environment.
Temporary waste storage	Warehouse for temporary storage of waste before it is transported to processing sites.
Waste disposal	A process that does not involve the recovery of products, even if the secondary effect of such a process is the recovery of substances or energy.
Waste producer	Anyone whose activity or existence generates waste (original waste producer).
Raw material processing plants	Industrial plants where various types of raw materials are processed on a large scale.
Waste prevention	Measures (actions) applied to a product, material or substance before it becomes waste.
Waste collection	Collection of waste prior to transport to treatment sites, including pre-sorting.

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